

**BRONZE DRUM CULTURE:
STUDY ON THE EFFECTIVENESS OF SOCIAL
COGNITIVE THEORY IN LEARNING
THROUGH CHILDREN ANIMATION IN
GUANGXI PROVINCE, CHINA**

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UNIVERSITI SAINS MALAYSIA

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**BRONZE DRUM CULTURE:
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COGNITIVE THEORY IN LEARNING
THROUGH CHILDREN ANIMATION IN
GUANGXI PROVINCE, CHINA**

by

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LIST OF SYMBOLS

| | |
|-----------|--|
| Cr | Authority coefficient of experts |
| C | The academic level of experts |
| Ca | The reference of the expert's judgment |
| Cs | The familiarity of experts to the content of AMs-BDC |
| Cv | Coefficient variation |
| Kendall's | A correlation quantity to calculate the correlation degree of multiple |
| W | rank variables. |
| po | Relative observed agreement among raters |
| pe | Hypothetical probability of chance agreement |

LIST OF ABBREVIATIONS

| | |
|----------------|--|
| BDC | Bronze Drum Culture |
| BDCC | Bronze Drum Cultural Circle |
| AMs-BDC | Animated Bronze Drum Cultural Materials |
| AnBDC | Animated Bronze Drum Culture |
| CsBDC | Children's Bronze Drum Culture |
| SCT | Social Cognitive Theory |
| SLT | Social Learning Theory |
| MET | Media Effects Theory |
| TPB | Theory of Planned Behavior |
| RAA | Reasoned Action Approach |
| ICH | Intangible Cultural Heritage |
| 2D-AT | Two Dimensional Animation Technology |
| 3D-AT | Three Dimensional Animation Technology |
| 2D-IG | Two Dimensional Interactive Games |
| VR-PT | Virtual Reality Panoramic Technology |
| PK | Perceived Knowledge |
| AA | Affective Attitudes |
| BI | Behavioral Intention |
| CsPK | Children's Perceived Knowledge |
| CsAA | Children's Affective Attitudes |
| CsBI | Children's Behavioral Intention |
| CsAB | Children's Actual Behavior |
| CsPK-BDC | Children's Perceived Knowledge Toward BDC |
| CsAA-BDC | Children's Affective Attitudes Toward BDC |
| CsBI-BDC | Children's Behavioral Intention Toward BDC |
| CsKSBI- BDC | Children's Knowledge-Sharing Behavioral Intention Toward BDC |

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**BUDAYA GENDANG GANGSA: KAJIAN MENGENAI KEBERKESANAN
TEORI KOGNITIF SOSIAL DALAM PEMBELAJARAN MENERUSI
ANIMASI KANAK-KANAK DI WILAYAH GUANGXI, CHINA**

ABSTRAK

Gendang gangsa merupakan artifak budaya yang penting di Selatan China dan Asia Tenggara, melambangkan pencapaian bersejarah etnik minoriti dalam bidang pertukangan logam, muzik, seni, tarian, dan agama. Dengan sejarah yang menjangkau lebih 2,700 tahun, ia mewakili warisan ketara dan tidak ketara yang amat bernilai di China. Namun, pemindahan budaya ini semakin terancam, terutamanya dalam kalangan generasi muda. Walaupun kajian terdahulu telah meneroka potensi teknologi animasi dalam usaha memelihara dan mempromosikan budaya gendang gangsa, masih terdapat kekurangan kajian empirikal yang menilai keberkesanannya dalam pembelajaran kanak-kanak. Kajian ini menyelidiki kesan pembelajaran berasaskan animasi terhadap pemahaman dan penghargaan kanak-kanak terhadap budaya gendang gangsa di Wilayah Guangxi, China, melalui perspektif Teori Kognitif Sosial. Pendekatan kaedah campuran telah digunakan, melibatkan temu bual dengan ibu bapa dan guru serta tinjauan ke atas kanak-kanak berusia 7–10 tahun. Hasil kajian menunjukkan kesan positif animasi dalam meningkatkan kognisi sosial kanak-kanak, memupuk minat mereka, serta mempengaruhi sikap dan tingkah laku mereka terhadap pemuliharaan budaya. Selain itu, kajian ini mengenal pasti teknologi animasi yang paling berkesan dalam memudahkan pembelajaran dan penglibatan kanak-kanak. Dengan mengintegrasikan animasi dalam pendidikan warisan, kajian ini menyediakan rangka kerja untuk pemindahan budaya dan menyumbang kepada aplikasi Teori Kognitif Sosial dalam

konteks budaya. Kajian ini turut mengakui beberapa keterbatasan, terutamanya berkaitan saiz sampel dan faktor demografi seperti jantina dan taburan umur. Kajian masa hadapan akan memperluaskan kumpulan peserta untuk merangkumi kanak-kanak dan remaja berusia lebih 11 tahun bagi meningkatkan kebolegunaan dapatan kajian ini. Kajian ini menawarkan pandangan yang bernilai kepada pendidik, pengamal warisan budaya, dan pereka media digital dalam mencari pendekatan inovatif untuk melindungi budaya gendang gangsa yang semakin pupus.

**BRONZE DRUM CULTURE: STUDY ON THE EFFECTIVENESS OF
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ANIMATION IN GUANGXI PROVINCE, CHINA**

ABSTRACT

The bronze drum is a significant cultural artifact in Southern China and Southeast Asia, embodying the historical achievements of ethnic minorities in casting, music, art, dance, and religion. With a history spanning over 2,700 years, it represents a vital aspect of China's tangible and intangible heritage. However, its transmission is increasingly at risk, particularly among younger generations. While previous studies have explored the potential of animation technology in preserving and promoting bronze drum culture, there remains a lack of empirical research examining its effectiveness in children's learning. This study investigates the impact of animation-based learning on children's understanding and appreciation of bronze drum culture in Guangxi Province, China, through the lens of Social Cognitive Theory. A mixed-method approach was employed, incorporating interviews with parents and teachers alongside surveys conducted with children aged 7–10 years. The findings reveal the positive effects of animation in enhancing children's social cognition, fostering interest, and influencing their attitudes and behaviors toward cultural preservation. Additionally, the study identifies the most effective animation technologies for facilitating learning and engagement. By integrating animation into heritage education, this research provides a framework for cultural transmission and contributes to the application of Social Cognitive Theory in cultural contexts. The study acknowledges certain limitations, particularly regarding sample size and demographic factors such as gender and age distribution. Future research will expand

the participant pool to include children and adolescents over 11 years old, broadening the study's applicability. This research offers valuable insights for educators, cultural heritage practitioners, and digital media designers seeking innovative approaches to safeguard the endangered bronze drum culture.

CHAPTER 1

INTRODUCTION

1.1 Introduction

In this chapter, we will examine the overarching framework of this research project. The chapter will commence with an overview of the study's background, followed by the presentation of the problem statement, research aim and objectives, research questions, research hypothesis, and the significance of the research. Additionally, this chapter will present the research limitations and provide a comprehensive elucidation of the operation definitions employed throughout the study. Finally, the chapter will outline the overall structure of the thesis.

1.2 Research Background

1.2.1 Overview of the Bronze Drum Culture (BDC) in the World

Bronze ware is integral to the world's material and cultural heritage. One of the most attractive bronze products is the bronze drums. The bronze drum has existed for more than 2700 years (Wan, F.B. & Zou, G.S. 2022). The bronze drum is one of the common carriers of ancient culture in south China and Southeast Asia. There are eight countries found the bronze drum in the world. For example, China, Vietnam, Malaysia, Indonesia, Thailand, Cambodia, Myanmar, and Singapore. Among them, Yunnan province, Guangxi Zhuang Autonomous Region of China, and Northern Vietnam found the most bronze drums. There are more than 2,400 surviving bronze drums worldwide, of which 1,460 are in China's collection and more than 900 in Guangxi of China in museums (Huang, Y. 2017). The Guangxi bronze drum holds a vital role globally. It is the only region with eight types (i.e. Wanjiaba type, Beiliu

type, Lingshan type, Ximeng type, Shizhaishan type, Lengshuichong type, Zunyi type, Majiang type) of bronze drums simultaneously (Wan, et al., 2022). China has the largest number of bronze drum types in the world.

The study of bronze drums dates back over 200 years, with the earliest literature records tracing the existence of bronze drums to 1705. (Wang, N.S., 2001). Previous scholars have generally studied the ancient bronze drums' origin, distribution, age, ethnic minorities, classification, decoration, function, use, nationality, casting technology, social significance, dissemination, and other aspects and have achieved fruitful results. (Wen, Y., 1978; Meyer, A. B., & Foy, W. , 1897; Heger, F., 1902; Herman, T.H. , 2018; Wei, T.T., 2021; Lv, D.J & He, Y.H., 1988; Duan, H.S., 2021; Chen, L.P. & Yang, H.C., 2022; Li, F. Q. et al., 2022; Jacques de Guerny & Liao, M. Q. 2022; Xia, B.G. & Yu, Z.J.2023; Qin, C.X., 2023). Both Chinese and Vietnamese scholars believed that the bronze drum first used in near the 7th century BC (Ruan, W.X. & Li, G., 1993; Wan et al., 2022) . However, scholars hold differing opinions on the geographic and ethnic origins of the bronze drum and have not reached a consensus. From the perspectives of history, geography, archaeology, carbon element detection, and similar artifacts from tombs, Chinese scholars had concluded that the bronze drum originated in southern China, specifically in central and western Yunnan (Wan et al., 2022; Wen, Y.,1978; Li, F.Q., 2022). Chinese scholars generally believed that the Wanjiaba-type bronze drum is the earliest type of bronze drum (Hong, S., 1974; Huang, Z.Q. & Zhang, Y.M., 1985; Wang, N.S., 1986). Because a drum-shaped kettle and a bronze drum were unearthed from a bronze coffin in Dabona Village, Xiangyun County, Yunnan Province, its shape is similar to bronze kettle (Feng, H.J., 1974; Li, W.Q., 1981; Tong, N.Z., 1986). Furthermore, researchers conducted further studies and concluded that during the

early Spring and Autumn period of the 8th century BC, the Pu people in central and western Yunnan Province, China, accidentally discovered that the bronze kettles they used for cooking produced a distinctive and excellent sound. Gradually, they adapted these kettles into percussion instruments (see **Table 1.1**), eventually leading to the development of the earliest Wanjiaba bronze drum. To validate the assertions made by Chinese scholars regarding the origin and dating of the Wanjiaba bronze drum, Li, Q.S. and Huang, D.R. (2007) analyzed the bronze drum's source using lead isotopes. Their analysis results further confirmed that both the Wanjiaba bronze drum and the Shizhaishan bronze drum were produced in the western Yunnan and Dianchi region. Moreover, Indonesian scholars, such as Herman, interviewed by Li, Z.Q. (2023), also supported that Indonesian bronze drums had closely ties to those of China. Both Chinese and Indonesian scholars generally agreed that the bronze drum was most likely originated from southern China. However, Vietnamese scholars hold different opinions. Ruan, W.X. and Li, G. (1993) believed that the bronze drum originated from northern Vietnam with the Dongshan bronze drum being considered the earliest, and the Wanjiaba bronze drum seen as a later development from it (Fan, M.X. & Huang, D.R., 2001; Ruan, C.Z. & Wang, J.D. 1992). This underscores the importance of determining the geographical origin of the bronze drum, which continues to be a crucial topic for further scholarly investigation.


Despite the ongoing debate regarding the geographic and ethnic origins of the bronze drum, this study asserts that, regardless of its origin, the bronze drum is closely link to ancestors of the Baiyue ethnic minorities in southern China and Southeast Asia. The Bronze Drum Culture (BDC) serves as evidence of the cultural exchanges between southern China and Southeast Asian countries.



The bronze drum transcends its role as a mere archaeological artifact,

assuming a central place in national culture and identity. It chronicles the achievements of ethnic minorities in Southern China and Southeast Asian across various domains, including casting, music, art, dance, and religion. Adorned with geometric patterns, depictions of daily life, warfare, animals and birds, and boats (Heidhues & Mary, 2000), the bronze drum boasts a long historical and cultural heritage spanning over 2,700 years, forming a representative BDC in Southern China and Southeast Asia (Chen, H., 2021; Wan, F.B., 2020).

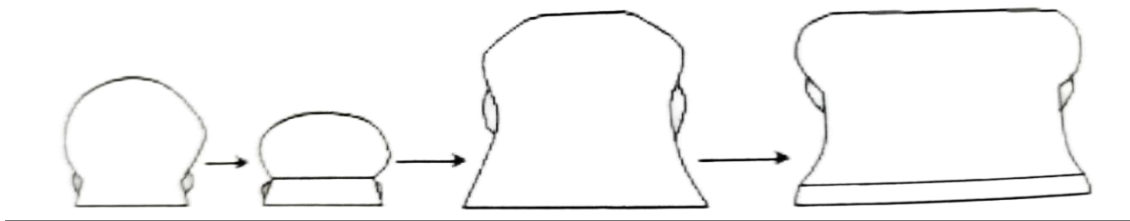
The BDC has given rise to a substantial cultural circle known as the "Bronze Drum Cultural Circle" across a broad region spanning Southern China and Southeast Asia (Zhao,T.Y. 2017; Li, Y.Z., 2021). The Bronze Drum Cultural Circle (BDCC) emerges as a distinctive cultural phenomenon unique to Southern China and Southeast Asia. The BDC represents a precious heritage shared by all humanity, necessitating collective protection and preservation efforts. Exploring the BDC serves as a conduit for deepening our understanding of the cultural systems prevalent among various ethnic groups in Southern China and Southeast Asia. Hence, the BDC holds profound significance for all ethnic communities in Southern China and Southeast Asia.

Table 1.1 The Types of Kettle

| Type of Kettle | Name | Age | Size | Found the Location |
|---|------------------------------|------------------|--------------------------------|---|
|  | Open-mouthed potter's kettle | Neolithic period | Calibred 12 cm, height 11.6 cm | Neolithic site in Baiyang Village, Binchuan County, Yunnan Province (Unearthed in 1973) |

| | | | | |
|---|---|---|---|--|
|  | <p>Bronze kettle with girdle and two ears</p> | <p>The Spring and Autumn (770-476 BC) and Warring States (475-221 BC) periods</p> | <p>Not in detail</p> | <p>Wanjiaba Tomb in Chuxiong County, Yunnan Province (Unearthed in 1975)</p> |
|  | <p>Plain bronze kettle (Jiang, T.Y. & Liao, M.J., 2012)</p> | <p>Not in detail</p> | <p>Caliber 26.5cm; Abdominal diameter; 25.5cm, The base diameter, 13.5cm, Height 19.5cm</p> | <p>Donglan Changjiang Township (Unearthed in 1987)</p> |

The evolution of the pottery kettle to the bronze drum (Wan et al., 2022)







The respective perspectives of Chinese and Vietnamese scholars regarding the origin of the bronze drum have significantly influenced their understanding of other important aspects of the bronze drum, including its classification. Since 1989, the classification of bronze drum types has undergone four main stages: initially, scholars proposed dividing bronze drums into six types based on their shapes and motifs (Meyer, A. B., & Foy, W. , 1897); subsequently, scholars argued for dividing bronze drums into four main types and three transitional types (Heger, F., 1902); then, Chinese scholars advocated for classifying bronze drums into eight types based on standardized criteria and naming them after the unearthed standards (Wan et al.,



2022); finally, other Chinese scholars proposed categorizing southern Chinese and Southeast Asian bronze drums into four periods and 10 types (Wan et al., 2022).

Historically, over 2,400 bronze drums have been handed down worldwide, with 1,460 located in China and 900 in Guangxi alone (Huang, Y.,2017). Notably, Guangxi stands out as the only region globally where eight types of bronze drums have been discovered (see **Table 1.2**). The type of Wanjiaba was found in Dongtian County of Guangxi in 1973. This finding filled the gap in a series of bronze drums (Chen, Q.F. & Huang, Z.L., 1993). Whether considering the extensive variety and distribution of bronze drums or the flourishing presence of folk bronze drums, Guangxi emerges as a representative region of the BDC. However, only the west and northwest region of Gui, and Nanning City are still using bronze drums now (Zhao, T.Y., 2017).




Table 1.2 The Types of Bronze Drum in Guangxi

| Heger Classification | Type of Bronze Drum | Chinese Classification | The Name of Bronze Drum | Year | Size | Motifs | Found the Location |
|---|--|--|---|------|--------------------------------------|---|--|
| Per- Heger I type (Bunker, & Emma. C., 1967) |  | Wanjiaba Bronze Drum | Nanhapo A Drum (Chen, Q.F. &Huang Z.L., 1997) | 1993 | Face Diameter 50 cm, Height 32 cm | Drum surface has sun motif with 15 rays, the waist has triangular oblique straight grain with longitudinal division, near feet and a week of three across motif and thunder motif.  | Nanhapo, Lianfu Village, Xiangzhou Township, Tiandong County, Guangxi District |
| Heger I Type |  | Shizhaishan Bronze Drum (Cited by Guangxi Museum of Nationalities) | Rowing race motif and bull motif bronze drum | 1991 | Face Diameter 36.4 cm, Height 27.5CM | Drum surface has sun motif with 18 rays, chest of drum has 5 halo, the middle of the main halo of symmetrical four groups of dragon boat race pattern, the main halo of the waist is 10, with the feather motif as the main side of the dot pattern of the vertical motif belt divided into 10 squares, lattice ornaments ox pattern, are male bull.  | Shatian Town, Hezhou City, Guangxi Province |

Continual Table 1.2 The Types of Bronze Drum in Guangxi

| Heger Classification | Type of Bronze Drum | Chinese Classification | The Name of Bronze Drum | Year | Size | Motifs | Found the Location |
|----------------------|---|--|--------------------------------|------|--|---|---|
| |  | Lengshuichong Bronze Drum(Jiang, T.Y., & Liao, M.J., 2012) | Teng County Lengshuichong Type | 1974 | Surface diameter 83.7cm Height 60.2cm | <p>The surface of drum has sun motif with 12 rays, the light between the feather eye motif, the light halo straight to the edge of the drum. They are water ripples, feather lines, etc. in the middle. The main halos are patterned bird pattern and deformed heron pattern, respectively. There are four frogs on the edge, with two groups of riding statues. The chest is phase back boat motif, the waist is deformed bird motif, foot hanging lobe motif, diamond eye motif, feather motif.</p> | Guangxi Teng County, Mengjiang Town, Xincheng village |
| | | | | | |  | |

Continual Table 1.2 The Types of Bronze Drum in Guangxi

| Heger Classification | Type of Bronze Drum | Chinese Classification | The Name of Bronze Drum | Year | Size | Motifs | Found the Location |
|----------------------|---|--|---|------|---|---|--|
| Heger II Type |  | Beiliu Bronze Drum (Cited by Guangxi Museum of Nationalities) | Shuichong yan Bronze Drum (No. 101 bronze drum) | 1955 | Surface diameter 165 cm, residual height 64cm, drum face thick 0.8 cm, Drum body thick 0.39-0.58 cm | The surface of drum has sun with 8 rays, 3 halo, and cloud motifs in the whole drum. The drum face is larger than body, which also has a 3-string halo with a dense halo circle, cloud and thunder patterns. Between the chest and waist there are two teams of round stem ring lugs with filigree patterns.  | Liuqing Town, Beiliu City, Guangxi |
| |  | Lingshan Bronze Drum (Jiang, T.Y., & Liao, M.J., 2012) | Yulin Liantang Ping Drum | 1993 | Drum face diameter 133.5-126.2cm, Height 73cm | The surface of drum has a sun motif with 11 rays, 3 halo, money motifs and cloud and thunder motifs. There are 6 groups frog statues clockwise. Among them four groups are squatting frogs and two groups carrying field winkle mollusc. Drum body decorated with money motifs, cloud and thunder motif. There are two | Liantang Ping drum, Shatian Town, Yulin, Guangxi |

pairs of wide flat ears between the chest and waist, and a tiger statue near the drum foot.



Heger III Type



Ximeng Type Bronze Drum (Guangxi Ethnic Affairs Museum)

Longzhou Longjiang Village Drum (No.031 Drum)

1971

Drum face diameter 49.9 cm, Height 33.4 cm

The surface of drum has a sun motif with 7 rays, 10 halo, single eye motif. There are Zhi motifs, thunder motif filled in line motifs, feather man motifs, heron motifs and birds motifs and flower diamond motifs.

Longjiang Drum, Longzhou County, Guangxi



Heger IV Type



Zunyi Type Bronze Drum

Guiping No.11 Drum

None

Drum face diameter 61cm, Height 35cm, Chest diameter 62.7cm, foot diameter

The surface of drum has a sun motif with 12 rays and the rays are filled with triangular drop motifs. There are Zhi motifs, concentric circles outside. The main halo is a slanting sun pattern and a distorted bird pattern. There are 4 groups of frog toes on the edge of the drum. The lower part of the body and waist of the drum is

Guiping, Guangxi

61.2cm

surrounded by a pectinic pattern and a band of concentric circles.



Majiang Type Bronze Drum
Tianyuan Kongming Drum

1973

Drum face diameter 47.8cm, Height 27.5cm

The surface of drum has a sun with 12 rays. The light is decorated with simplified feather eye motifs, "You" word motif, flower motifs, nail motifs, ring nail motifs, feather motifs. There are 4 "Kangua" lines, the main halo cast Chinese inscriptions, and the small character is "Tianyuan Kongming".

Du'an County, Guangxi



1.2.2 Overview of the Bronze Drum Culture in Guangxi, China

From the late Warring States period to the Han Dynasty, the "Baiyue blend" occurred in the southern regions of Lingnan and areas south of the Yangtze River. Xi'ou and Luoyue emerged as two major branches, primarily distributed in what is now the Guangxi region, collectively referred to as "Ou'Luo." It was in these regions that the bronze drum originated and subsequently spread widely throughout southern China. Upon reaching Guangxi, it gradually assimilated into the local culture, undergoing inheritance, development, and expansion. The roles and functions of the bronze drum became increasingly diverse: it was utilized for hunting, as a musical instrument, for ceremonial purposes, as a form of reward, for shellfish storage, as burial items, and as ritual vessels (Wan et al., 2022). The bronze drum has become an indispensable tool in the daily life of the Zhuang people in ancient Guangxi.

Simultaneously, the bronze drum serves as a carrier of national culture, reflecting the production, daily life, and social activities of those who cast and used it. It embodies the harmonious aesthetic spirit of the people. During significant festivals, such as the Maguai Festival, Zhuzhu Festival (also known as Danu Festival), Spring Festival, Zhuang Double-Third Festival, and others, ethnic minorities in Guangxi play the bronze drums to pray for favorable weather, peace, and happiness in the upcoming year. These festivals typically span a month, from the first day of the Chinese New Year to the end of the second day of February (see **Figure 1.1** and **Figure 1.2**).

Furthermore, bronze drums are struck to mark everyday essential activities, such as weddings and house-building ceremonies among the Zhuang and Yao people. Gradually, the bronze drum has become an integral part of the lives of the Zhuang, Yao, and other ethnic minorities in Guangxi, giving rise to a unique BDC.

There was once a saying describing the status of bronze drum in Guangxi, "The world's bronze drums are in China, and China's bronze drums are in Guangxi" (Ding, J., 2022). Guangxi is the most important region for the distribution of bronze drum and is recognized as the home of ancient bronze drums due to the largest number and variety it contains (He, L.Q., 2015). The southern bronze drum and the northern tripod are simultaneously listed as representatives of Chinese bronze ware. Guangxi is renowned as the "hometown of bronze drums," where the BDC has been passed down from generation to generation. The Guangxi bronze drum embodies the wisdom and great creativity of the ancestors of various ethnic minorities, symbolizing Guangxi's history and culture, and contributing significantly to the preservation of traditional Chinese culture. The Zhuang ethnic bronze drum custom was listed as a national intangible cultural heritage (ICH) in 2006 (Wan, F.B, & Zou, G.S., 2022). Thus, it can be seen that the BDC holds a pivotal position in Guangxi, China.



Figure 1.1 Villagers in Donglan, Guangxi Zhuang Autonomous Region, celebrate the "MaGuai Festival" and ring on a bronze drum (Gao, D.F., 2021)



Figure 1.2 The Dance of Bronze Drum in Zhuzhu Festival (Cited by Ethnic

1.2.3 Overview the Current Statues of Bronze Drum Culture in Guangxi

With the passage of time, the BDC of the village has undergone significant impacts, resulting in a greatly reduced living space (Wan et al., 2022, pp.104-105). In October 2021, while teaching in Guilin, Guangxi, I introduced an interactive game of BDC to stimulate undergraduate students to better understand national culture (see **Figure 1.3**). Subsequently, I interviewed the students and found that many local undergraduate students in Guangxi lacked understanding of what the bronze drum and the BDC were. Even those students with an interest in national culture lacked suitable avenues for learning about the BDC. This finding was profoundly surprising to me.



Figure 1.3 Bronze Drum Culture Survey in Guilin University of Technology

For instance, interviews were conducted with students majoring in animation at Guangxi Guilin University of Technology (see **Table 1.3**), including two Zhuang nationality students, two Yao nationality students, and one Han nationality student. Among them, Liao Yuluan (Sophomore), a Zhuang girl from Liuzhou, Guangxi, expressed her thoughts:

"We have limited exposure to ethnic minority culture and lack individuals to pass it down and teach us. Personally, I rarely encounter bronze drums. In the past,

the older generation faced hardships and focused solely on survival. Consequently, our parents were unable to identify their specific Zhuang branch due to family planning, resulting in a loss of inheritance of the BDC. I am deeply interested in the BDC and have always been eager to learn more about it. However, opportunities to learn about Zhuang minority culture are scarce. My only exposure has been through interactions with the Miao people, as my mother belongs to the Miao ethnic group, which places significant emphasis on traditional culture. The Miao people celebrate the "Ge Xv" festival, featuring grand performances centered around playing the Lusheng instrument. Unfortunately, these events are often distant and difficult to witness firsthand. The scale of the Miao festival I attended was impressive and spectacular, yet I have never witnessed a similar celebration within the Zhuang community. Children are not exposed to the BDC, and it is not commonly discussed. Many people in Guangxi, not just ourselves, need to pay more attention to Zhuang culture. There has been limited inheritance in this regard, which I deeply regret. As a member of a minority group, I lack opportunities and means to learn about it. Many Guangxi residents migrate elsewhere for work, resulting in minimal exposure to the BDC. While some express interest in learning, the lack of inheritance and educational resources poses a challenge. I am highly intrigued by ethnic minority culture, but avenues for understanding it are few. I have previously visited Miao communities, where cultural preservation appears more robust compared to Zhuang culture. Zhuang culture evokes a sense of tranquility within me. I am particularly interested in the bronze drum game. While young people engage in various activities, the integration of traditional elements, such as Zhuang clothing in games like "King of Glory," is commendable. However, the prominence of bronze drum culture remains relatively low."

Wei Cainen (sophomore), a Zhuang girl residing in Donglan County, Hechi City, Guangxi Province, expressed:

"We see bronze drums in my county, but only occasionally. They are used during holidays when older people bring them out to play. I haven't seen them during the Spring Festival, but the Double-Third Festival is quite lively. However, I didn't experience it much as a child; I found it very noisy, and now I don't have time to go back and appreciate it. The older generation could be more active in using the bronze drums, but young people and children hardly participate. We have bronze drum culture, but it's relatively limited, and the distance between villages is quite far, which leads to greater dispersion. Young people and children are less engaged with the BDC, and they may need to understand its value. Personally, I am not particularly interested in the BDC."

In modern society, as young people move to cities for study and work, most show little interest in ancient cultures like the BDC. They perceived the BDC as irrelevant to their lives, believing it has no application in their work, study, or daily activities. They also lack awareness of its significant value. To alleviate the immense economic pressure, most young people leave their hometowns to engage in jobs or businesses that offer financial benefits year-round. Consequently, they have few opportunities to connect with the bronze drum, making it difficult for elderly experts to find suitable inheritors (Luo,Y.Y. & Zhang,B.S. 2023). The inheritance and development of the BDC face significant challenges.

Increasingly, young people are unaware of the BDC, and its living heritage exists only in a few areas such as Guangxi, Yunnan, and Guizhou in China, and some countries in Southeast Asia. The number of bronze drums and the ethnic groups that

use them have significantly decreased (Wan et al., 2022). Therefore, it is urgent to protect the BDC of Guangxi.

Table 1.3 The Demographic of Interviewee

| No. | Name | Age | Gender | Nationality | Home Address | School | Major |
|-----|--------------|-----|--------|-------------|----------------------|---------------------------------|-----------|
| 1 | Zhou Honghui | 21 | Male | Han | Guangxi Nanning City | Guilin University of Technology | Animation |
| 2 | Liao Yvluan | 19 | Female | Zhuang | Guangxi Liuzhou City | Guilin University of Technology | Animation |
| 3 | Zhang Yuzhou | 21 | Female | Yao | Guangxi Hezhou City | Guilin University of Technology | Animation |
| 4 | Wei Cainen | 20 | Female | Zhuang | Guangxi Hechi City | Guilin University of Technology | Animation |
| 5 | Lan Peiyuan | 22 | Male | Yao | Guangxi Hechi City | Guilin University of Technology | Animation |

The influence of modern culture has caused an age gap in the heritage of BDC, which has led to the decline of the once-flourishing BDC in Guangxi (Zhao, 2017). Some scholars surveyed that people in Guangxi had low understanding in BDC and a cold attitude towards it. For example, 54.9% of primary school students in Guangxi said they did not know about the ICH of Guangxi (including BDC), 17.1% only knew a little, and 70.3% of primary school students were not interested and had a cold attitude (Hao, 2011). More than 75% of the youth only knew about bronze drums and did not know about the culture related to bronze drums (Chen, 2021). Li, G. F. (2020) found that the people in Guangxi had a low cognition of animation containing cultural elements of Guangxi ethnic minorities, while about 50% of them had never seen any cultural animation of Guangxi ethnic minorities. Among them, 52.60% of participants thought that Guangxi ethnic minority cultural animation works were average, 6.8% of participants did not like it, and even 4% hated it.

In modern society, children are constantly exposed to new media, including films, short videos and television. They tend to prefer watching TV, movies, or engaging with more entertaining and enjoyable songs rather than participating in traditional activities such as playing the bronze drums. Most of them find bronze drum activities to be dull and outdated. Although some young individuals are familiar with the bronze drum, they often lack a deeper understanding of its cultural significance, motifs, associated festivals, and legends. As time progresses, the BDC faces the risk of being lost to history in China. To avert the decline of BDC, it is essential to stimulate children's interest and enhance their knowledge of this cultural heritage. Researchers need to explore innovative methods to engage the younger generation.

1.2.4 Overview of Digital Animation Technology to Protect Chinese Traditional Culture Policy

With the development of digital technology in China, the digitization of traditional culture through animation and the strategy of employing digital animation for cultural communication have emerged as significant topics and trends in engaging younger audiences with traditional culture. Over the past decade, the Chinese government has introduced a comprehensive array of policies aimed at promoting the use of animation technology to disseminate and promoting outstanding traditional culture.

In 2012, the outline of the national plan for cultural reform and development during the 12th Five-Year Plan period proposed accelerating the development of emerging cultural industries, including cultural creativity, digital publishing, mobile multimedia, animation, comics, and games, et al. The plan aimed to establish a "Cultural Digitization Construction Project" that focuses on the digitization of

cultural resources, production, and communication, with the goal of creating cultural works that are attractive, insightful, and beneficial to young people (The CPC Central Committee & State Department, 2012). This initiative underscores the importance of the animation industry within the cultural sector.

In September 2020, General Secretary Xi Jinping emphasized the necessity for the comprehensive prosperity of the press, publication, radio, film, and television sectors during a symposium with experts in education, culture, health, and sports. He stressed that the importance of aligning these sectors with the development trends of digital industrialization and industrial digitization to foster cultural learning among youngsters (Xi, J.P., 2020), thereby underscoring the importance and urgency of cultural digitization.

In 2021, the "14th Five-Year Plan for the Development of Cultural Industries" proposed the establishment of a more robust cultural industry and market system. It emphasized the need to enhance the quality and efficiency of the animation industry, promote the telling of Chinese stories through animation, and strengthen the spiritual well-being of the population, especially among the youth (Ministry of Culture and Tourism (MCT), 2021).

In 2022, the 14th Five-Year Plan for cultural development encouraged cultural units and the broader Internet community to produce content that complies with legal standards, thereby generating more high-quality films, animations, games, and other online audiovisual programs. This initiative aims to effectively implement projects that facilitate the inheritance and development of China's rich traditional culture, promote the creation and dissemination of classic Chinese folk stories, and support relevant policies for the advancement of cultural enterprises, the protection

and utilization of cultural relics, and the preservation of ICH (The CPC Central Committee & State Department, 2022).

The development direction of the animation industry focuses on enhancing both quality and efficiency to effectively convey the Chinese narrative through animation, particularly in relation to the BDC. To promote the application and technological development of animation in Guangxi's cultural heritage, including BDC, the Guangxi government has implemented a series of policies (see **Table 1.4**) aimed at promoting the employment of animation technology in the field of BDC.

Digital animation technology represents a new avenue where digital innovations serve as the primary vehicle for enhancing cultural inheritance and fostering innovation. This encompasses various forms of digital media, including digital animation, interactive technology, virtual reality (VR), augmented reality (AR), and other technical modalities. It is important to expand research on prioritizing the basic cultural rights and interests of vulnerable groups, particularly children, which has now emerged as a central focus in the field of cultural digitalization research (Liu, H. & Bai, X.J., 2024). This emphasizes the importance of as a vital demographic in cultural dissemination, highlighting that their needs cannot be overlooked.

Table 1.4 A Series of Policies in Guangxi

| Year | Policy Name | Content |
|------|---|--|
| 2012 | The Implementation Plan for Accelerating the Integration of Culture and Science and Technology. | Put forward clear measures aimed at fostering the development of the animation industry and enhancing the training of animation professionals. |
| | The Implementation Plan for Cultivating 200,000 Innovative Entrepreneurs | |

| | | |
|---------------|---|---|
| 2015, 2016 | <p>"Action Plan for Promoting the Integrated Development of Cultural and Creative industries and Design Services";</p> <p>"Notice on the Implementation Plan for Accelerating the Development of Trade in Services";</p> <p>"Some Policy Measures for Promoting the Development of Cultural Industries"</p> | <p>The Guangxi government has issued documents that strongly support implementation of the original animation boutique cultivation project, aimed at further accelerating the development of the animation industry.</p> |
| 2017 | <p>The Guangxi Cultural Development "Thirteenth Five-Year Plan"</p> | <p>This Plan proposes the promotion of a cultivation plan for original animation boutiques. This plan emphasizes the selection of outstanding original animation production from Guangxi, supporting their creation, production and dissemination, while highlighting the unique charm of Zhuang culture. Additionally, it encourages the development of original games that embody national characteristics and promote health, aiming to enhance the cultural depth of game products, and enhance the core competitiveness of the game industry."</p> |
| 2017- 2020 | <p>The Guangxi Cultural Industry Leap-forward Development Action Plan (2017-2020)</p> | <p>"Animation" was mentioned 33 times and deployed as the cultural industry section's first "brand" highlighting digital content. Under the government's vigorous promotion, the Guangxi animation industry has developed rapidly.</p> |
| 2021 | <p>The Digital Economy Development Plan for Buildings in the Guangxi Zhuang Autonomous Region (2021-2025)</p> | <p>It aims to vigorously promote intelligent logistics, gaming and animation, competent medical care, among other sectors. It emphasizes big data processing, and the application of Internet of Things technologies in building construction, while actively fostering the development of a digital economy innovation ecosystem within the building industry.</p> |
| 2022- 2026 | <p>Notice of the General Office of the People's Government of Guangxi Zhuang Autonomous Region on the Printing and Distribution of the Fourteenth Five-Year Plan for Cultural and Tourism Development of Guangxi</p> | <p>To promote the application of a new generation of information technology in cultural creation, production, dissemination, consumption, and other links guided by digitalization , To promote the upgrading of the animation industry, focus on cultivating several digital animation brands with independent intellectual</p> |

property rights and reflecting the characteristics of Guangxi ethnic minorities.

2024-2026 Notice of the Department of Culture and Tourism of Guangxi Zhuang Autonomous Region on the Issuance of the Three-year Action Plan for the Development of Guangxi Cultural Tourism Industry (2024.6)

To promote the active utilization of cultural resources. To promote the innovative utilization of intangible cultural heritage resources such as "Guangxi Double-Third," color opera, GUI opera, Wuzhou Cantonese Opera, and bronze drum custom. Creative development of "immersive" and "interactive" exhibition experience, vigorous research and development Wen Bowen to create unique products, promote the two-way enabling of cultural and tourism space and promote the museum to become a popular tourist destination. Digitalization enables high-quality development of the cultural tourism industry. We will use digital technology to guide industrial upgrading, foster new quality productivity in the cultural and tourism industry, and accelerate the application of technological achievements such as big data, artificial intelligence, virtual reality, and augmented reality in the cultural and tourism sectors.

1.3 Problem Statement

According to the research background, it is reasonable to assert that the BDC, a significant ICH in Southern China and Southeast Asia, faces a severe inheritance dilemma due to changes in modern society, living conditions, and educational environment. This dilemma is further exacerbated by the prevalence of digital entertainment and the modernized surroundings in which children are immersed (Ding, J, 2022; Handayani et al., 2020), eventually leading to a lack of interest and awareness of the BDC among children. The decreasing numbers of inheritors of the BDC may result in numerous negative consequences, such as its potential loss to the world (Li, F.Q. & Ma, J.W., 2021). Such influences are already observable in certain areas of Guangxi cities; in 2022, only a few children and young people were aware

of the BDC (Lin et al., 2022), most cities lack BDC-related activities (Zhao, T.Y., 2017). Consequently, bronze drums have become mere decorations displayed in museums, with most children unaware of their significance (Hao, 2011; Zhao, T.Y., 2017; Chen, 2021). Therefore, exploring effective methods and identifying an appropriate technologies to stimulate children's positive affect, enhance their cognitive understanding of the BDC, and enhance their intention to learn about and sharing the BDC is of great practical significance and necessity.

Although previous research have gradually shifted digital technologies to an important position within the domain of BDC (Xiong, W. & Qiu, C., 2019), and has acknowledged the importance of identifying different animation technologies in learning (Berney, S., & Bétrancourt, M., 2016), challenges persist for animation designers. Prior studies have yet to yield a consistent conclusion regarding the communication effects of different animation technologies. Furthermore, research focusing on the specific effects of animation technologies on children within the BDC context remains limited and scarce.

Recent studies on digital technologies in the domain of BDC protection and inheritance have increased (Liu, H. & Bai, X.J., 2024; Wan et al., 2022; Ding, J., 2022) , however, most have primarily focused on the application stage. Various animation technologies, including 2D and 3D animation technology (see **Appendix A**), have been utilized, and many elements of BDC have been incorporated into animations or illustrations (Cheng, X., 2022) . Nevertheless, limited research has focused on the impact of these technologies on children's perceived knowledge, affective attitudes, behavioral intentions, and actual behaviors towards BDC. Furthermore, studies examining the most effective technology for enhancing children's cognition of BDC are scarce (Zhang & Ismail, 2022). In Guangxi, there are

over ten animations featuring BDC content and more than four different types animation technologies available for children (see **Appendix A**) . Consequently, the application of animation in BDC is no longer the primary concern. Therefore, the first gap this study intends to address is to shift the concentration from application to comparison of effects. Additionally, among the limited literature exploring the effects of animated BDC technologies, most studies emphasize interactive technology, interest, and immersive experiences, which describe the reasons some young people may dislike BDC.

Yi, Q.Z. and Su, J.Q, (2019) proposed that the digital communication of Luoyue culture, including BDC, has achieved some results, but challenges remain, such as relatively simple form of expression, a narrow audience, and unsatisfactory communication effects. These issues primarily arise from a lack of interaction on digital platforms. Zhang, T. and Zhao, Y (2019) argued that digital products lacked interactivity and that there was a deficiency of engaging and interactive products aimed at the public. Wei, Y.F., et al. (2023) suggested that designers should fully utilize VR technology to display the bronze drum collection comprehensively, including the decomposition of the internal patterns and structures of each bronze drum for display purposes. In this study, considering that the Guangxi government, along with numerous scholars and animation designers, had used VR and interactive technology for the protection and inheritance of BDC (Liu, Y., 2023), we can affirm that the use of interactive applications of animation technology in BDC is already a reality. Therefore, this research aims to shift the focus from the application of interactive technology in BDC to a comparative analysis of the effects of various animation technologies, identifying the most effective technology regarding children's cognition, affective responses, and behavioral intentions toward BDC. This