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EVOLVING TRADITIONS: THE INTERPLAY OF CULTURAL HERITAGE, TECHNOLOGICAL INNOVATION, AND EDUCATION IN CONTEMPORARY CERAMIC ART

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Abstract: This study explores the dynamic relationship between cultural heritage, technological innovation, and education within the field of contemporary ceramic art. By synthesizing recent literature, the research highlights how ceramic art functions as a crucial cultural repository, preserving historical narratives and fostering global artistic exchanges. It examines the integration of modern technologies, such as digital preservation and advanced materials, into traditional practices, revealing a trend towards innovation that enhances both the durability and accessibility of ceramic art. The study also emphasizes the pivotal role of education in sustaining and advancing ceramic art, advocating for curricula that balance traditional craftsmanship with contemporary skills. Challenges in ceramic art education are identified, along with opportunities for modernization. The findings underscore the importance of ongoing interdisciplinary approaches and global cultural exchanges in ensuring the continued relevance and evolution of ceramic art.

Keywords: Cultural heritage; Technological innovation; Contemporary ceramic art; Digital preservation; Advanced materials; Artistic exchange; Ceramic art education

1 INTRODUCTION

1.1 Historical and Cultural Foundations of Ceramic Art

Ceramic art, with its origins traced back to ancient civilizations, represents a crucial element of cultural heritage. In the Kashmir Valley, for instance, the Neolithic archaeological sites of Burzahom, Gufkral, Simthan, and Kanispur have unearthed a rich collection of artifacts, including pottery, terracotta objects, and stone tools, that provide insights into the cultural practices of early societies [1]. These artifacts highlight the craftsmanship and artistic expressions of the time, reflecting the socio-cultural dynamics that shaped the development of ceramic art in the region.

Similarly, the ceramic heritage of Neolithic Kashmir, as examined by Paray and Kumar, showcases the intricate designs and functional forms that were prevalent during this era [2]. The fine finishes and advanced craftsmanship observed in these artifacts indicate a high level of sophistication in the ceramic practices of ancient Kashmir, offering a glimpse into the daily lives and cultural significance of these early communities.

1.2 Technological Advancements in Ceramic Art

The evolution of ceramic art has been significantly influenced by technological advancements, which have enabled artists to push the boundaries of traditional practices. The use of digital media and virtual simulation technologies, as explored by Cai, has opened new avenues for the preservation and display of ceramic art [3]. These technologies provide artists and educators with innovative tools to create, protect, and showcase ceramic art in ways that were previously unimaginable, ensuring that this intangible cultural heritage is preserved for future generations.

The integration of polymer materials in contemporary ceramic art, as researched by Hu et al., represents another significant technological advancement [6]. By incorporating these modern materials, artists are able to enhance the mechanical strength and flexibility of their creations, offering new possibilities for artistic expression. This fusion of traditional ceramic techniques with modern materials exemplifies the ongoing innovation within the field of ceramic art, reflecting a blend of historical knowledge and contemporary creativity.

Moreover, the "Ceramic Road" project, discussed by Huong, highlights the use of ceramics to narrate historical events and showcase traditional pottery villages through a large-scale ceramic painting [4]. This project underscores the potential of ceramic art to serve as a medium for cultural storytelling, using traditional materials and techniques to create contemporary works that resonate with modern audiences.

1.3 The Intersection of Tradition and Modernity in Ceramic Art

The blending of traditional and modern elements in ceramic art is a recurring theme in contemporary scholarship. Cheng (2023) examines the cultural significance of lacquer items and pottery, emphasizing the importance of preserving traditional craft designs while fostering contemporary growth [5]. This approach ensures that the rich heritage of ceramic art is not lost but instead evolves to meet the needs of modern society.

In a similar vein, the study by Kidega, Kwesiga, and Sizoomu on the integration of Ugandan fauna and flora into ceramic art highlights the role of cultural heritage in contemporary artistic practices [7]. By incorporating elements of the natural environment into their work, artists are able to create pieces that not only celebrate cultural identity but also raise awareness about environmental conservation. This integration of cultural and environmental themes reflects the multifaceted nature of contemporary ceramic art, which serves both aesthetic and socio-cultural purposes.

The cross-cultural exchange of ceramic art practices, as explored by Liping in the context of Dali-Sukhothai relations, further illustrates the global nature of ceramic art [8]. The study reveals how different cultures have influenced each other's ceramic traditions, leading to the development of unique artistic expressions that blend diverse cultural elements. This cross-pollination of ideas and techniques enriches the global ceramic art landscape, demonstrating the interconnectedness of cultural heritage and artistic innovation.

Educational Strategies and the Role of Ceramic Art in Learning

Ceramic art education plays a crucial role in preserving and promoting this art form, particularly through the integration of traditional practices into modern curricula. Dong and Wang discuss the incorporation of Jingdezhen ceramic "Intangible Cultural Heritage" into art and design courses in Chinese universities [9]. This integration not only enhances the ideological and political education of students but also ensures that traditional ceramic techniques are passed down to future generations. The importance of interdisciplinary approaches in ceramic art education is highlighted by Lee, who advocates for a curriculum that combines cultural understanding with practical skills [10]. By fostering an appreciation for the cultural context of ceramic art, educators can provide students with a more holistic understanding of the art form, encouraging them to explore its historical roots and contemporary applications.

The practical application of ceramic art education is further explored by Nortey, who emphasizes the importance of hands-on experience in the classroom [11]. By bringing authentic materials into the learning environment, educators can bridge the gap between theory and practice, allowing students to engage directly with the artistic process. This approach not only enhances technical skills but also fosters a deeper connection to the cultural and historical significance of ceramic art.

1.4 The Cultural Significance of Ceramic Art in Literature

Ceramic art, often viewed as a tangible representation of cultural heritage, has been extensively documented in literature, particularly in studies focusing on historical artifacts. The work of Ahmed, Farswan, and Singh on the prehistoric artifacts of Kashmir, for instance, highlights the role of ceramic art in understanding the socio-cultural dynamics of ancient civilizations [1]. The authors explore how pottery and terracotta objects unearthed in Kashmir Valley reveal not just the daily lives of Neolithic people but also their artistic expressions and cultural values. The detailed study of these artifacts serves as a testament to the intricate craftsmanship and the symbolic meanings imbued in ceramic art, thereby positioning ceramics as a critical lens through which we can examine historical and cultural narratives.

Similarly, Paray and Kumar contribute to the literature on the cultural heritage of ceramics through their examination of Neolithic Kashmir's ceramic artifacts [2]. Their research underscores the sophistication of early ceramic practices and how these artifacts, with their fine finishes and functional forms, provide insights into the cultural and artistic priorities of the time. Literature like this not only preserves knowledge of these artifacts but also fosters an appreciation for the historical significance of ceramics in human civilization.

1.5 Intersection of Tradition and Innovation in Ceramic Art

As literature on ceramic art evolves, it increasingly reflects the dynamic interplay between tradition and innovation. This is particularly evident in studies that explore the integration of modern technology into traditional ceramic practices. Cai's work on digital protection and virtual display technology in ceramic art exemplifies this intersection [3]. By leveraging digital media, Cai argues that traditional ceramic art can be preserved and displayed in innovative ways that enhance both accessibility and engagement. This study highlights how literature can serve as a platform for discussing the preservation of intangible cultural heritage in the digital age, ensuring that traditional practices are not only maintained but also adapted to contemporary contexts.

Further contributing to this discourse is the research by Hu et al., which explores the application of polymer materials in contemporary ceramic art [6]. This study represents a significant shift in the literature towards understanding how modern materials can be integrated into traditional art forms to enhance durability and artistic expression. By documenting these advancements, literature plays a crucial role in bridging the gap between past and present, ensuring that ceramic art continues to evolve while retaining its cultural essence.

Cheng also delves into the blending of traditional and modern elements in ceramic art, focusing on the use of lacquer in pottery [5]. The study emphasizes the importance of preserving traditional craft designs while fostering contemporary

growth. Literature like Cheng's serves as a critical resource for artists and scholars alike, providing insights into how traditional practices can be reinterpreted in modern contexts to create innovative works that resonate with contemporary audiences.

1.6 The Role of Education in Sustaining Ceramic Art

Education is a recurring theme in literature on ceramic art, particularly concerning how traditional practices can be sustained and adapted through educational initiatives. Dong and Wang explore this in their study on the integration of Jingdezhen ceramic "Intangible Cultural Heritage" into the curriculum of art design majors in Chinese universities [9]. Their research highlights how educational institutions can play a pivotal role in preserving traditional crafts by incorporating them into modern curricula. By doing so, they not only preserve these practices but also ensure that they continue to evolve and remain relevant in contemporary art and design.

Similarly, the work of Nortey emphasizes the importance of practical education in ceramic art [11]. Nortey argues that bringing authentic materials into the classroom bridges the gap between theory and practice, allowing students to engage directly with the artistic process. This hands-on approach is crucial for fostering a deeper connection to the cultural and historical significance of ceramic art, ensuring that students do not merely learn about these practices in an abstract sense but also experience them firsthand. Literature on educational strategies in ceramic art, therefore, serves as a guide for educators seeking to develop curricula that balance the preservation of traditional techniques with the exploration of contemporary artistic possibilities.

Lee's (2020) research on interdisciplinary cultural understanding in ceramic art education further expands on this theme [10]. Lee advocates for a curriculum that combines cultural appreciation with practical skills, providing students with a holistic understanding of ceramic art. By documenting these educational strategies, literature contributes to the ongoing dialogue about how best to teach and preserve ceramic art in a way that honors its cultural roots while embracing modern innovations.

1.7 Contemporary Expressions and Global Influences in Ceramic Art

Literature on ceramic art also explores the contemporary expressions of this traditional craft, particularly how global influences shape modern practices. The study by Liping on the cross-cultural exchange between Dali and Sukhothai in ceramic art creation illustrates how different cultures influence each other's artistic traditions [8]. This exchange leads to the development of unique artistic expressions that blend diverse cultural elements, enriching the global ceramic art landscape. Literature like this underscores the interconnectedness of cultural heritage and artistic innovation, showing how traditional practices are continually reinterpreted and adapted in different cultural contexts.

Mahmoud and Alwan's exploration of the intellectual and artistic concepts of cultural context in contemporary Arab ceramic sculpture further contributes to this global perspective [12]. Their study reveals how cultural contexts influence the production and circulation of ceramic art in the Arab world, highlighting the role of literature in documenting and analyzing these regional variations. Such research provides valuable insights into how ceramic art functions as a medium for cultural expression across different societies.

Kidega, Kwesiga, and Sizoomu's study on integrating Ugandan fauna and flora into ceramic art identity is another example of how contemporary literature explores the fusion of traditional and modern elements in ceramic art [7]. By incorporating natural elements into their work, Ugandan artists create pieces that celebrate cultural identity and raise environmental awareness. This intersection of cultural and environmental themes reflects the broader trend in literature towards examining how ceramic art serves not only aesthetic purposes but also socio-cultural and environmental functions [13].

2 METHODOLOGY

The methodology employed in this research involves a comprehensive literature review, focusing on the analysis and synthesis of scholarly articles related to ceramic art, cultural heritage, educational strategies, and technological advancements [14]. The primary sources for this review were selected based on their relevance, recency, and contributions to the understanding of ceramic art. Key databases such as IEEE Xplore, SpringerLink, and JSTOR were utilized to access peer-reviewed journals, ensuring the credibility and academic rigor of the sources.

The selection process involved identifying articles published between 2019 and 2024 that address the intersection of tradition and innovation in ceramic art, the role of education in preserving and evolving ceramic practices, and the influence of cultural contexts on contemporary ceramic art [15]. The chosen articles were systematically reviewed, with key themes and findings extracted and categorized. This approach allowed for a structured analysis of how ceramic art is documented and studied within the academic community, providing insights into both historical perspectives and contemporary practices.

3 RESULTS

The results of this literature-based study provide a comprehensive understanding of the multifaceted nature of ceramic art, emphasizing its cultural significance, the intersection of tradition and modernity, and the critical role of education in

preserving and advancing this art form as shown in Table 1-4 . Through the detailed analysis of various scholarly articles, several key findings have emerged, shedding light on the evolving landscape of ceramic art and its continued relevance in contemporary society [16].

Table 1: Summary of Cultural Significance in Ceramic Art Studies

Study	Region/Focus	Time Period	Key Findings
Ahmed, Farswan, & Singh (2024) [1]	Prehistoric Kashmir	Neolithic Period	Artifacts reflect daily life and cultural values of ancient Kashmir societies
Paray & Kumar (2024) [2]	Neolithic Kashmir	Neolithic Period	Advanced craftsmanship and symbolic meanings in ceramic artifacts
Liping (2022) [8]	Dali-Sukhothai Cross-cultural	14th-16th Century	Cross-cultural influences leading to unique ceramic art expressions
Mahmoud & Alwan (2023) [12]	Contemporary Arab Sculpture	20th-21st Century	Cultural contexts influencing ceramic art in the Arab world

Note: The studies demonstrate how ceramic art serves as a critical cultural repository across various regions and periods. The focus on Neolithic to contemporary eras highlights ceramics' role in preserving and reflecting cultural values, artistic expressions, and historical narratives globally.

Table 2: Integration of Modern Technologies and Materials in Ceramic Art

Study	Technology/Material Used	Application Area	Key Outcomes
Cai (2023) [3]	Digital Protection and Display	Preservation and Education	Enhanced accessibility and engagement through virtual technologies
Hu et al. (2022) [6]	Polymer Materials	Contemporary Ceramic Art	Increased durability and artistic possibilities through modern materials
Cheng (2023) [5]	Lacquer Techniques with Pottery	Blending Tradition with Modernity	Preservation of traditional designs while fostering contemporary growth
Li, Xu, & Xinyu (2024)	Virtual Simulation Engine	Ceramic Art Education	Improved understanding and creation through simulated ceramic properties

Note: These studies illustrate the successful integration of modern technologies, such as digital preservation and advanced materials, into traditional ceramic practices. This blending enhances both the preservation of cultural heritage and the expansion of artistic possibilities, bridging the gap between historical craftsmanship and contemporary innovation.

Table 3: Role of Education in Ceramic Art

Study	Educational Strategy	Implementation Area	Key Findings
Dong & Wang (2021) [9]	Integration of Intangible Cultural Heritage	Chinese Universities	Promotes cultural preservation and innovation in art and design programs
Nortey (2023) [11]	Hands-on Learning with Authentic Materials	Art Education	Enhances student engagement and understanding of ceramic processes
Lee (2020) [10]	Interdisciplinary Cultural Understanding	Curriculum Development	Combines cultural appreciation with practical skills for holistic education
Pek, Cihaner Keser, & Güler (2022)	Modernization of Ceramic Art Curriculum	Ceramic Industry Education	Identifies challenges and opportunities for improving industry-relevant education

Note: The research underscores the importance of education in sustaining and advancing ceramic art. By integrating traditional practices into modern curricula and emphasizing hands-on learning, educational strategies ensure the continued relevance and evolution of ceramic art, fostering a deeper cultural and artistic appreciation among students.

Table 4: Global Influences on Contemporary Ceramic Art

Study	Cultural Influence	Impact Area	Key Findings
Liping (2022) [8]	Dali-Sukhothai Cultural Exchange	Ceramic Art Creation	Blending of cultural traditions to create unique ceramic art expressions

Mahmoud & Alwan (2023) [12]	Arab Cultural Contexts	Contemporary Ceramic Sculpture	Cultural contexts shaping production and intellectual concepts in art
Kidega, Kwesiga, & Sizoomu (2023) [7]	Ugandan Fauna and Flora Integration	Ceramic Art Identity	Creation of culturally and environmentally significant ceramic art

Note: The studies reveal how global cultural exchanges influence contemporary ceramic practices. Cross-cultural interactions lead to unique artistic expressions and adaptations, enriching the ceramic art landscape by incorporating diverse cultural elements and addressing modern social and environmental issues.

3.1 Cultural Significance and Historical Foundations

One of the most prominent themes identified in the literature is the deep cultural significance of ceramic art, particularly its role as a historical artifact that offers insights into ancient civilizations. The studies by Ahmed, Farswan, and Singh and Paray and Kumar highlight how ceramic artifacts from prehistoric Kashmir serve as crucial tools for understanding the socio-cultural dynamics of ancient societies [1-2]. These artifacts, ranging from pottery to terracotta objects, reflect the daily lives, artistic expressions, and cultural values of Neolithic communities. The intricate craftsmanship observed in these pieces underscores the importance of ceramic art as a means of preserving cultural heritage and offering a tangible connection to the past.

These findings are significant because they illustrate how ceramic art functions as a cultural repository, preserving the traditions, beliefs, and practices of ancient peoples [17]. The detailed documentation and analysis of these artifacts in the literature ensure that this knowledge is not lost, but instead, it is passed down to future generations. This continuity is vital for maintaining a cultural identity and for providing a foundation upon which contemporary ceramic practices can build.

3.2 The Intersection of Tradition and Modernity

The literature also reveals a dynamic interplay between traditional ceramic practices and modern innovations, particularly in how contemporary artists and educators incorporate new materials and technologies into their work. Cai's exploration of digital protection and virtual display technology in ceramic art represents a significant advancement in how traditional art forms are preserved and presented [3]. By utilizing digital tools, artists and curators can ensure that ceramic art is not only protected but also made more accessible to a global audience. This approach allows for a broader appreciation of ceramic art and enhances its educational value by providing interactive and immersive experiences.

Similarly, the research by Hu et al. on the application of polymer materials in contemporary ceramic art highlights the innovative ways in which modern materials are being integrated into traditional art forms [6]. This study shows that by enhancing the mechanical properties of ceramic pieces, artists can explore new forms and techniques that were previously impossible. The blending of traditional ceramic techniques with modern materials exemplifies the ongoing evolution of the art form, demonstrating that ceramic art is not static but continually adapting to new possibilities.

Cheng's work on the blending of traditional lacquer techniques with modern pottery further supports this notion [5]. Cheng argues that preserving traditional craft designs while fostering contemporary growth is essential for ensuring the survival of these practices in a rapidly changing world. The results from these studies suggest that the integration of traditional and modern elements in ceramic art is not only possible but also beneficial, leading to richer and more diverse artistic expressions [18].

3.3 The Role of Education in Sustaining Ceramic Art

Education emerges as a crucial factor in sustaining and advancing ceramic art, as highlighted in several studies. Dong and Wang provide insights into how Jingdezhen ceramic "Intangible Cultural Heritage" is being integrated into the curriculum of art design majors in Chinese universities [9]. Their research shows that by incorporating traditional ceramic practices into modern educational programs, institutions can play a vital role in preserving these art forms. This integration not only helps in maintaining cultural heritage but also in promoting innovation by encouraging students to explore and reinterpret traditional techniques.

The importance of practical education in ceramic art is further emphasized by Nortey, who advocates for the inclusion of authentic materials in the classroom [11]. Nortey's findings suggest that hands-on experience is essential for students to develop a deep understanding of ceramic art. By engaging directly with the materials and processes, students are able to connect more meaningfully with the cultural and historical significance of their work. This approach to education ensures that ceramic art remains a living tradition, continually evolving as it is passed down through generations.

Lee also contributes to the discussion on education by exploring the benefits of an interdisciplinary approach in ceramic art education [10]. Lee's research indicates that combining cultural appreciation with practical skills provides students with a more comprehensive understanding of ceramic art. This interdisciplinary approach is crucial for developing a curriculum that not only preserves traditional practices but also encourages innovation and creativity.

3.4 Contemporary Expressions and Global Influences

The results also reveal the significant impact of global influences on contemporary ceramic art, particularly through cross-cultural exchanges. Liping's study on the Dali-Sukhothai cross-cultural ceramic art creation illustrates how different cultural traditions can influence each other, leading to the development of unique artistic expressions [8]. This cross-pollination of ideas and techniques enriches the global ceramic art landscape, demonstrating the interconnectedness of cultural heritage and artistic innovation.

Mahmoud and Alwan's research on the cultural context of contemporary Arab ceramic sculpture further highlights the regional variations in ceramic art practices [12]. Their study shows that the production and circulation of ceramic art in the Arab world are deeply influenced by cultural contexts, which in turn shape the artistic concepts and intellectual frameworks within which artists operate. These findings underscore the importance of understanding ceramic art within its specific cultural and historical contexts, as these factors significantly impact the form and content of the art [19].

The study by Kidega, Kwesiga, and Sizoomu on integrating Ugandan fauna and flora into ceramic art identity is another example of how contemporary artists are drawing on their cultural heritage to create works that are both aesthetically pleasing and socially relevant [7]. By incorporating elements of the natural environment into their art, these artists are able to create pieces that resonate with contemporary issues such as environmental conservation and cultural preservation. The results from this study suggest that ceramic art can serve as a powerful medium for addressing social and environmental issues, further enhancing its relevance in today's world [20].

3.5 Challenges and Opportunities in Ceramic Art Education

Finally, the results from Pek, Cihaner Keser, and Güler's study highlight the challenges faced by ceramic art education, particularly in adapting to the needs of the ceramic industry [21]. Their research points to deficiencies in current educational programs, such as outdated curricula and a lack of focus on industrial applications. However, the study also identifies potential opportunities for improvement, such as the incorporation of modern design tools and techniques into the curriculum. By addressing these challenges, educational institutions can better prepare students for careers in the ceramic industry, ensuring that they have the skills and knowledge needed to succeed in a rapidly evolving field.

4 CONCLUSION AND DISCUSSION

The study of ceramic art, as reflected through the literature, reveals a rich and dynamic field where tradition and modernity coexist, and where cultural heritage plays a pivotal role in both historical understanding and contemporary artistic expression [22]. This essay has explored various dimensions of ceramic art, including its cultural significance, technological advancements, educational strategies, and global influences. The results have shown that ceramic art is not only a reflection of cultural identity and history but also a medium that continues to evolve, integrating new materials, technologies, and educational practices.

4.1 Cultural Significance and Historical Continuity

One of the most striking conclusions drawn from the literature is the enduring cultural significance of ceramic art. Studies such as those by Ahmed, Farswan, and Singh and Paray and Kumar demonstrate that ceramic artifacts from regions like Kashmir provide invaluable insights into ancient societies [1-2]. These artifacts are not mere remnants of the past; they are active participants in the storytelling of human history. They reflect the daily lives, beliefs, and artistic expressions of ancient peoples, preserving knowledge that might otherwise be lost.

This continuity of cultural significance is vital for understanding how ceramic art functions as a cultural repository. The meticulous craftsmanship observed in ancient artifacts, as discussed in these studies, underscores the importance of ceramics in preserving cultural heritage. The literature suggests that by studying these artifacts, we gain a deeper understanding of the socio-cultural dynamics that shaped human civilization. This understanding is crucial not only for historians and archaeologists but also for contemporary artists who seek to draw inspiration from the past [23].

4.2 The Integration of Tradition and Innovation

The integration of modern technologies and materials into ceramic art is another key theme that emerges from the literature. Studies by Cai and Hu et al. highlight how traditional ceramic practices are being transformed through the use of digital tools and advanced materials [3,6]. This integration is not just about preserving traditional techniques; it is about pushing the boundaries of what ceramic art can be in the modern world.

Cai's exploration of digital protection and virtual display technology represents a significant advancement in how ceramic art is preserved and presented [3]. By leveraging digital media, artists and curators can make ceramic art more accessible to a global audience, ensuring that these traditional practices are not only preserved but also appreciated by future generations.

This approach aligns with the broader trend of digitization in the arts, where technology is used to enhance engagement and accessibility.

Similarly, the work by Hu et al. on the application of polymer materials in contemporary ceramic art demonstrates the innovative potential of combining traditional techniques with modern materials [6]. The use of polymers not only enhances the durability of ceramic pieces but also opens up new possibilities for artistic expression. This blending of old and new reflects a broader trend in the arts where tradition serves as a foundation upon which new ideas and practices are built [24]. Cheng's research on the blending of traditional lacquer techniques with modern pottery further illustrates this trend [5]. The study highlights the importance of preserving traditional craft designs while fostering contemporary growth. This balance between preservation and innovation is crucial for ensuring that traditional practices remain relevant in a rapidly changing world. The literature suggests that this blending of tradition and modernity not only enriches the field of ceramic art but also ensures its continued evolution.

4.3 The Role of Education in Sustaining Ceramic Art

Education plays a critical role in sustaining and advancing ceramic art, as highlighted in several studies. The research by Dong and Wang on the integration of Jingdezhen ceramic "Intangible Cultural Heritage" into university curricula underscores the importance of education in preserving traditional practices [9]. By incorporating these practices into modern educational programs, institutions can ensure that the knowledge and skills associated with ceramic art are passed down to future generations.

The literature emphasizes that education is not just about preserving the past; it is about encouraging innovation and creativity. Northey's advocacy for hands-on learning with authentic materials illustrates how practical education can bridge the gap between theory and practice [11]. By engaging directly with the materials and processes of ceramic art, students can develop a deeper understanding of the art form and its cultural significance. This approach to education ensures that ceramic art remains a living tradition, continually evolving as it is passed down through generations.

Lee's research on interdisciplinary cultural understanding in ceramic art education further supports this notion [10]. The study suggests that combining cultural appreciation with practical skills provides students with a more holistic understanding of ceramic art. This interdisciplinary approach is crucial for developing a curriculum that not only preserves traditional practices but also encourages students to explore and reinterpret these practices in contemporary contexts.

4.4 Global Influences on Contemporary Ceramic Art

The literature also reveals the significant impact of global influences on contemporary ceramic art. Studies such as those by Liping and Mahmoud and Alwan illustrate how cross-cultural exchanges shape modern ceramic practices [8,12]. These exchanges lead to the development of unique artistic expressions that blend diverse cultural elements, enriching the global ceramic art landscape [25].

Liping's study on the Dali-Sukhothai cross-cultural ceramic art creation highlights how different cultural traditions influence each other, resulting in the creation of new forms and techniques [8]. This cross-pollination of ideas is a testament to the dynamic nature of ceramic art, where tradition and innovation coexist in a continually evolving dialogue.

Similarly, Mahmoud and Alwan's exploration of the cultural context of contemporary Arab ceramic sculpture underscores the regional variations in ceramic art practices [12]. Their study shows that the production and circulation of ceramic art in the Arab world are deeply influenced by cultural contexts, which in turn shape the artistic concepts and intellectual frameworks within which artists operate. This regional focus in the literature provides valuable insights into how ceramic art functions as a medium for cultural expression across different societies.

The study by Kidega, Kwesiga, and Sizoomu on integrating Ugandan fauna and flora into ceramic art identity further illustrates the intersection of cultural heritage and environmental awareness in contemporary ceramic practices [7]. By incorporating natural elements into their art, Ugandan artists create works that resonate with contemporary issues such as environmental conservation and cultural preservation. The literature suggests that ceramic art can serve as a powerful medium for addressing social and environmental issues, further enhancing its relevance in today's world.

4.5 Challenges and Opportunities in Ceramic Art Education

The literature also highlights several challenges and opportunities in ceramic art education. The study by Pek, Cihaner Keser, and Güler identifies deficiencies in current educational programs, such as outdated curricula and a lack of focus on industrial applications [21]. However, the study also points to potential opportunities for improvement, such as the incorporation of modern design tools and techniques into the curriculum [26].

Addressing these challenges is crucial for ensuring that ceramic art education remains relevant and effective. The literature suggests that by modernizing educational programs and incorporating industry-relevant skills, institutions can better prepare students for careers in the ceramic industry. This modernization is necessary not only for preserving traditional practices but also for fostering innovation and creativity in the field.

5 FUTURE STUDIES

Future research could focus on several key areas to further advance the field of ceramic art. Firstly, studies could explore the long-term impact of digital preservation techniques on the accessibility and engagement with ceramic art globally. Secondly, research could examine the effectiveness of various educational models that integrate traditional and modern practices, particularly in preparing students for industry demands. Thirdly, a comparative analysis of cross-cultural influences in ceramic art across different regions could provide deeper insights into how global interactions shape contemporary practices. Additionally, studies could investigate the environmental impact of new materials used in ceramic art, evaluating their sustainability and potential to replace traditional materials. Lastly, exploring the psychological and therapeutic effects of engaging with ceramic art in both educational and clinical settings could open new avenues for the application of ceramic art in mental health and well-being.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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A STUDY ON CHINESE LEARNERS' EMOTION IN TPRS TEACHING METHOD: A SOCIOCULTURAL THEORY PERSPECTIVE

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Abstract: This paper tries to take the sociocultural theory as the perspective and the TPRS teaching method as the research object, to explain and analyze the role of TPRS in promoting the positive motivation of Chinese language learners, to explore the development prospects, and to put forward suggestions for improvement.

Keywords: Sociocultural theory; TPRS; Initiative; Emotion; Cognition

1 INTRODUCTION

In recent years, the application of sociocultural theory (SCT) in the field of second language acquisition has gradually increased and become one of the mainstream theoretical frameworks, which is of great significance in guiding the practice of Chinese language teaching and academic research. The theory focuses on the influence of the social environment on the individual learner or the interaction between the two, and emphasizes the importance of the learner's initiative and practical activities. The dialectical unity of cognition and emotion, individual and environment advocated by the theory is an important inspiration for the development of international Chinese language.

In terms of language learning and teaching, Swain emphasized the key role played by learners' emotions while also recognizing the inextricable link between emotions and cognition [1]. Qin Lili et al. explored the role played by novice teachers' emotions in their cognitive development, concluding that emotions can either facilitate or hinder their cognitive development[2]. Therefore, it has become a top priority for Chinese language learning issues to exert the subjective initiative of Chinese language learners, to help students establish the ability to perceive the pleasure of learning Chinese, the ability to regulate their emotions, and the ability to control themselves until they internalize their Chinese language ability.

The social environment is the source of psychological development[3]. However, in order for the objective social environment to be the source of an individual's development, the individual needs to interact with it by understanding, interpreting, acting, and reconstructing it [4]. In this way, the individual and the social environment form a dynamic interactive system, "the Social Situation of Development" (SSD) [5].

In the perspective of SCT, the socio-cultural environment should be regarded as the core influencing factor of mobility. Among the socio-cultural factors, cultural product moderators (e.g., rational instructional design) have a major impact on agency, and the impact of cultural product moderators is mainly manifested in the aspects of "rational arrangement of class tasks" and "task-driven" [6].

In view of this, this paper tries to take perezhivanie, mediation, activity theory, scaffolding, Zone of Proximal Development (ZPD), and affordance in SCT as the perspective, to find out how the TPRS teaching method can be used in each classroom. The role and development direction of TPRS on Chinese learners' initiative are explained and analyzed, so as to stimulate domestic scholars' interest in the research on the international Chinese classrooms under the perspective of SCT and to provide references and guidance to promote the relevant research in this field in China.

2 TPRS TEACHING SESSIONS

2.1 Listening and Speaking

2.1.1 Establishing the meaning of vocabulary

The teacher presents the target vocabulary directly to students in Pinyin form rather than in written Chinese characters with translations into the students' mother tongue, and some simpler, less ambiguous words can be shown through pictures or body movements. The amount of target vocabulary should not be too much, but limited, and it will be displayed throughout the entire listening and speaking section, in order to facilitate the learners to look up new words quickly when they do not understand them, so as to ensure 100% comprehensible input.

The TPRS method emphasizes comprehensible input is important, and 100% comprehensible input is the guarantee of a relaxed classroom atmosphere. Therefore, the TPRS method advocates "listening first" and the use of Pinyin instead of Chinese characters in the listening input process, in order to minimize the obstacles and anxiety caused by Chinese characters to learners. According to SCT, cognitive and affective factors interact with each other and exist dialectically. Teachers provide scaffolding with reference to the students' Zone of Proximal Development (ZPD), which means the distance between the actual level of development and the potential level of development. An individual's development depends on the quality of the mediation received within his or her ZPD. If a problem-solving task exceeds the learner's cognitive capacity and leads to negative emotions, the learner's potential in the ZPD is reduced [7]. Since Chinese characters are non- phonetic, students whose native language is phonetic are generally intimidated by reading and

writing Chinese characters. In order to avoid negative emotions triggered by students' lack of self-assessment skills, teachers should use pinyin to establish the connection between sound and meaning when building vocabulary scaffolds, and then use Chinese characters to present the text materials in the subsequent reading portion to establish the connection between sound, meaning, and writings.

In addition, for simple vocabulary that can directly point to or describe specific things, actions, states or degrees, teachers can connect body movements with word meanings, and use games, performances and other practical exercises to mobilize students' various organs to participate in the learning process, so that the vocabulary can be used in communicative contexts for deepening vocabulary retention and good learning results. This teaching concept also fits SCT that the development of human thinking comes from the social interactions that individuals participate in the socio-cultural environment [8].

2.1.2 Building stories

The teacher presents the target vocabulary directly to students in Pinyin form rather than in written Chinese characters with translations into the students' mother tongue, and some simpler, less ambiguous words can be shown through pictures or body movements. The amount of target vocabulary should not be too much, but limited, and it will be displayed throughout the entire listening and speaking section, in order to facilitate the learners to look up new words quickly when they do not understand them, so as to ensure 100% comprehensible input.

In this teaching session, the PPT synchronizes the target vocabulary, target language points and freebies with storybuilding. The teacher and students make up a story together, with the teacher being responsible for providing the correct sentences and paragraphs with the target vocabulary and target language points through circular questions, and the students being responsible for providing the content and ideas of the story by answering the circular questions.

The storybuilding session can create an experience similar to "mind flow", which can stimulate learners' high degree of excitement and satisfaction, and its stimulating effect is mainly reflected in the following aspects:

(1) Unconsciousness

Teachers provide students with a lot of repetitions of limited vocabulary in listening activities to the extent that students can fully understand the language. The target vocabulary and language points can be acquired naturally after the students receive a large amount of comprehensible input, without excessive attention[9].

(2) Participation

Bring students into the story, make them the main characters, and bring their personal feelings and real life into the discussion. Teachers mobilize all students to develop their brains and mobilize their linguistic memory and imagination to promote the development of the story, but do not force students to express themselves orally, and even allow them to use their body language or a small amount of their mother tongue to replace the target language when they can't express themselves in the target language. In a relaxed and pleasant class atmosphere, students can actively participate in class discussions and talk about their own views and opinions, thus practicing their comprehension, listening level and speaking skills under the guidance of the teacher.

When the teacher utters a correct sentence, students need to respond immediately, such as saying the Chinese word "ah" with a dawning tone and gestures to interact with the teacher, which is a forced interaction method that can quickly capture students' attention and keep them engaged.

(3) Conflict

In order to make the story more interesting, teachers need to create problems or conflicts for the storyline, and introducing the target language in this process can make the target language get a lot of repetition opportunities.

(4) Unpredictability

In circular questions, the teacher chooses questions that are interesting to the learners in the context of the learners' lives or current events, and changes the angle of questioning constantly. When the teacher's questioning time, target and content are unpredictable, learners will be more attentive[10].

The above motivational features create a low affective filter and develop positive affective factors such as motivation and self-confidence, which are derived from the socio-cultural environment of the language in which the student lives. The social situation is a system of interaction and relationship between the individual and the environment. The social situation becomes SSD when the individual perceives, interprets and becomes emotionally attached to the social situation of the moment through his or her own perezhivanie[11].

Veresov emphasizes that individual development comes from conflictual events in social interactions, the latter also called dramatic events (drama), and that only those social relationships that are "dramatic", i.e., those that result from the conflicts or dramatic events in the individual's social environment that have an impact on the individual's emotions, become a source of development[12]. In such dramatic experiences, the interaction between emotion and cognition becomes more prominent, triggering qualitative changes in psychological functioning, and thus the situation is regarded as a turning point [13] or a growth point [14] in the development of the individual, at which time intervention and regulation are more effective, which provides theoretical support for social regulation and intervention in Chinese language education.

2.2 Reading

2.2.1 Direct character recognition reading

The class story created jointly by teachers and students in the listening session is organized into texts, presented to students in the form of Pinyin and subsequent Chinese characters, and read aloud for review, so as to establish the connection between sound, meaning and writings. This instructional strategy is called “direct character recognition reading” (CCR), in which students read a Chinese text without being taught the new words in advance; CCR is based on the premise that the language in the reading material has already been acquired in the brain in terms of sound and meaning before the students read the text, and that this acquisition occurs through a great deal of repetitive and interesting comprehensible input in listening and speaking activities[15]. After completing Chinese character literacy through extensive reading of stories in CCR, the student is capable of reading new texts that he has never heard or read before and that are not related to the stories told in class.

After the reading is completed, the teacher can introduce appropriate discussion by substituting the learner for the main character of the story and asking the learner about his attitude or approach.

2.2.2 Extended reading

Extended reading is based on the class stories created in the listening and speaking session. After completing the basic version of the reading material, the teacher and students can change the main characters according to the structure of the story, link up old knowledge, add interesting information, and adapt the story to get more versions of the story.

Students were generally active and focused during the reading activities for two reasons:

The CCR reading method helps students read the Chinese text directly and develop the habit of understanding and generating new language. Since the language in the reading material is 100% comprehensible to the students in the listening session, the students use the “Chinese voices” present in their minds to quickly recognize and read the unlearned Chinese characters and guess the meanings of the words, and the whole reading process is easy, pleasant and enjoyable for them.

Direct character recognition reading and extended reading provide sufficient affordance for learner’s motivation. Their highly repetitive features such as high internal repetition, high proximal repetition, and extensive text make each target word repeated hundreds of times, and it is this extensive and unpredictable repetition that makes for fluent readers[16]. In the subsequent read-aloud practice activities, teachers used a variety of read-aloud methods, such as teacher-led reading, whole-class reading, group reading, relay reading, and finally organized reading games for students in groups, to provide students with more than enough visual input time for recognizing Chinese characters. Peer interaction and teacher-student interaction practice the ZPD and scaffolding theory, and the theories reveal the social and cultural characteristics of cognitive development.

From the affordance theory, the relationship between the affordance of the environment and the efficacy of the learners is mutually defined and determined. In other words, if there is a match between something in the environment and the learner, affordance can be produced[17]. In reading activities, students are able to effectively perceive and interpret the potential learning resources and interactive learning opportunities of the reading environment, and therefore they generally take positive language learning actions.

2.3 Writing

The writing part includes task writing for describing the pictures and free writing for writing stories.

In order to allow learners to produce more written output in a low-affective-filtered learning environment, the TPRS pedagogy does not have a hard-and-fast rule on whether or not to use Chinese characters in the writing task, and encourages learners to write Chinese characters while allowing them to use Pinyin to organize their language.

In the section of writing stories, the author recommends the reading-writing integrated continuation task as a complement and refinement to the writing section. The pedagogy advocates maximizing the synergistic effect of output and comprehension in conjunction with external input[18]. The continuation task activates almost all the positive factors of enhancing learning, including the most important, learners’ initiative[19].

3 COUCLUSIONS

In the TPRS pedagogy, the relaxed and interesting class atmosphere, the highly participatory learning model and the unpredictable class stories greatly increase students’ interest and participation, and the high-density circular questions provide students with a large amount of comprehensible input, which encourages and stimulates them to generate more target language[20]. The pedagogy has a unique advantage in mobilizing students’ subjective initiative. Under the perspective of SCT, when studying the facilitating effect of TPRS on learners’ motivation, the socio-cultural environment and historical experiences of learners are considered as components of the motivation system, which is more in line with the ecology of Chinese language learners.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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RESEARCH ON THE HIGH-QUALITY DEVELOPMENT OF UNIVERSAL CHILDCARE SERVICES UNDER THE BACKGROUND OF AGING AND DECLINING BIRTHRATE

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Abstract: Globally, ageing and declining birth rates have become major social problems for countries. Under this background, this paper discusses how to alleviate the shortage of social labor force, promote the sustainable development of economy and improve the family welfare by developing the high-quality child care service. This paper first analyzes the current situation of aging and the decline of birth rate and their impact on the social structure, and then puts forward the importance of universal child care services. By comparing the development models of child care service at home and abroad, this paper summarizes the experiences and challenges in policy support, resource allocation, service standards, etc. , this paper puts forward some suggestions on the path of the high-quality development of the national child care service, which is suitable for the conditions of our country.

Keywords: Aging; Universal child care services; Quality development; Policy support

1 INTRODUCTION

With the rapid development of my country's social economy, the problem of aging and low birth rate has become increasingly prominent. Against this background, universal childcare services have become an important issue facing the new era. The high-quality development of universal childcare services aims to meet the multi-level and diversified needs of the majority of families, which is conducive to alleviating fertility pressure and promoting the optimization of the population structure. This paper aims to analyze the connotation, challenges and countermeasures of high-quality development of universal childcare services under the background of aging and low birth rate, and provide theoretical support for the formulation and implementation of relevant policies[1].

1.1 Background and Challenges of the Phenomenon of Aging and Low Birth Rate

With the rapid development of my country's social economy, the phenomenon of aging and low birth rate has become increasingly prominent, which has brought serious challenges to my country's population structure and social and economic development. Against this background, childcare services have become a topic of great concern. [Background and challenges of the phenomenon of aging and low birth rate] This part mainly analyzes the causes, impacts and challenges of the phenomenon of aging and low birth rate in my country[2].

First, the main reasons for the phenomenon of aging and low birth rate are as follows: First, the change in fertility concepts, modern young people pay more attention to personal development and quality of life, resulting in a decline in the willingness to have children; second, the cost of raising children continues to rise, especially in terms of housing prices and education expenses, making young families more cautious about the issue of childbearing; third, the social security system is not sound, and the elderly care issue has become a heavy burden on the family, further affecting the decision to have children.

Secondly, the phenomenon of aging and low birth rate has brought many challenges to my country's social and economic development. In terms of population structure, the reduction in labor supply and the gradual disappearance of the demographic dividend have put pressure on economic growth. In terms of social security, aging has increased the burden on pension insurance, medical insurance and other systems, which may lead to a deficit in pension funds. In terms of family education, the low birth rate has increased family education investment, which may lead to a shortage of family education resources.

In response to these challenges, the Chinese government actively advocates and develops universal childcare services. Universal childcare services aim to provide high-quality and low-cost childcare services to the majority of families, helping families solve the worries of raising children. The development of universal childcare services is conducive to improving my country's population structure and enhancing family childbearing willingness. It is also an important measure to achieve sustainable economic and social development.

In the context of aging and low birth rate, the high-quality development of inclusive childcare services has great practical significance. This requires us to make efforts in many aspects such as policy system, service system, and talent training to promote my country's inclusive childcare services to a new level. The subsequent chapters of this paper will conduct in-depth discussions on these issues, in order to provide useful reference for the high-quality development of inclusive childcare services in the context of aging and low birth rate in my country[3].

1.2 The Importance of Inclusive Childcare Services

In today's society, the problems of aging and low birth rate are becoming more and more serious, which has brought many challenges to my country's economic and social development. In this context, the importance of inclusive childcare services has become more and more prominent. [High-quality development of inclusive childcare services] has become an important means for my country to cope with the challenges of aging and low birth rate and promote the optimization of population structure.

First, inclusive childcare services are conducive to alleviating family fertility pressure. In the context of aging and low birth rate, family fertility faces many difficulties, such as high cost of raising children and heavy family burden. By developing inclusive childcare services, family fertility costs can be reduced, family burdens can be reduced, and the willingness to have children can be stimulated, which is conducive to the improvement of my country's population structure.

Secondly, inclusive childcare services help to increase the employment rate of women. To a large extent, fertility is a major challenge faced by women in the workplace. By developing inclusive childcare services, women can get adequate care and support after giving birth, which is conducive to their return to the workplace, increasing employment rates and realizing personal values.

Thirdly, inclusive childcare services are conducive to improving the quality of human resources in my country. High-quality inclusive childcare services can provide a good growth environment for infants and young children, which is conducive to the physical and mental health of infants and young children, and cultivate more high-quality talents for our country. At the same time, parents can devote more energy to their children's education and growth, and improve the quality of family education[4].

Finally, inclusive childcare services help promote social equity. Through government investment and development of inclusive childcare services, the gap between urban and rural areas and regions in childcare services can be narrowed, so that more families can enjoy policy dividends and promote social equity.

In short, in the context of aging and fewer children, the importance of inclusive childcare services is self-evident. High-quality development of inclusive childcare services is conducive to my country's response to population structure challenges and promoting sustainable economic and social development. Therefore, governments at all levels and all sectors of society should attach great importance to the development of inclusive childcare services, continuously improve the policy system, improve service quality, and provide strong support for my country's response to the problem of aging and fewer children.

2 THE CURRENT STATUS OF THE DEVELOPMENT OF INCLUSIVE CHILDCARE SERVICES UNDER THE BACKGROUND OF AGING AND LOW BIRTHRATE

In the context of my country facing the problem of aging and low birthrate, the development of inclusive childcare services has received widespread attention. In the [Current Status of the Development of Inclusive Childcare Services under the Background of Aging and Low Birthrate] section, we will analyze the current development status of inclusive childcare services in my country, in order to provide useful reference for policy makers and practitioners[5].

2.1 Current Status and Trends of Aging and Low Birthrate in my country

With the rapid development of my country's social economy, the problem of aging and low birthrate has become increasingly prominent. According to my research, the current status of aging and low birthrate in my country is manifested as: the number of elderly people continues to grow, the proportion of the total population continues to rise, and the fertility rate declines year by year. This phenomenon has had many impacts on the sustainable development of the economy and society, the most significant of which is the growing demand for inclusive childcare services[6].

Under the background of aging and low birthrate in my country, the high-quality development of inclusive childcare services has become an urgent problem to be solved. In order to meet this challenge, the government and all sectors of society need to work together to start from the following aspects:

- 1) Improve policies and regulations: formulate a series of policies and regulations on aging and low birth rate and universal childcare services to provide institutional guarantees for high-quality development.
- 2) Increase fiscal investment: increase fiscal support for universal childcare services, reduce family fertility costs, and increase fertility willingness.
- 3) Optimize the service system: build a diversified and multi-level universal childcare service system to meet the diverse needs of different families and children.
- 4) Improve service quality: strengthen the training and management of universal childcare service personnel, ensure service quality, and improve the satisfaction of parents and society.
- 5) Promote social participation: encourage and guide social capital to invest in the field of universal childcare services, and form a benign development pattern with the joint participation of the government, enterprises, and society.
- 6) Strengthen publicity and promotion: improve the whole society's awareness of aging and low birth rate and universal childcare services, establish scientific fertility concepts, and create a social atmosphere conducive to fertility and childrearing.

Through the above measures, universal childcare services in the context of my country's aging population and declining birth rate are expected to achieve high-quality development and bring benefits to families and society[7].

2.2 Policy system and development overview of universal childcare services

Against the background of an aging population and low birth rate in my country, the high-quality development of universal childcare services is particularly important. [Policy system and development overview of universal childcare services] This chapter aims to analyze the policy measures and their effectiveness taken by the Chinese government in promoting the development of universal childcare services[8].

2.2.1 Construction of the policy system

- 1) Policy and regulatory level: The government has formulated a series of policies and regulations on infant and child care services to provide legal guarantees for the development of universal childcare services. For example, the "Guiding Opinions on Promoting the Development of Infant and Child Care Services for Children Under 3 Years Old" clarifies the goals, tasks and policy measures for the development of universal childcare services.
- 2) Fiscal support policy: The government provides strong financial support for universal childcare services, and reduces family fertility costs and improves the accessibility of universal childcare services by setting up special funds, subsidies, tax incentives and other means.
- 3) Land and planning policies: The government gives priority to the land supply and planning of universal childcare service facilities to ensure the implementation of the project.
- 4) Talent training and introduction policies: encourage colleges and vocational schools to open majors related to infant care, support in-service personnel training, introduce high-level overseas talents, and improve the professional quality of inclusive childcare service personnel.

2.2.2 Development overview

- 1) Establishment and improvement of the service system: my country has gradually established an inclusive childcare service system based on families, supported by communities, and supplemented by institutions.
- 2) Improvement of service capabilities: By 2023, the number of inclusive childcare service facilities in my country will increase year by year, and the service capabilities will be significantly improved.
- 3) Service quality supervision: The government will strengthen supervision of the quality of inclusive childcare services, promote industry standardization, and ensure that infants and young children are well cared for in inclusive childcare service institutions.
- 4) Social capital participation: With the optimization of the policy environment, more and more social capital has been invested in the field of inclusive childcare services, which has promoted the development of the industry.
- 5) Improved parent satisfaction: With the joint efforts of the government, enterprises and society, the parent satisfaction of inclusive childcare services in my country has increased year by year, providing strong support for family fertility intentions.

In short, under the background of aging and low birth rate, the Chinese government attaches great importance to the high-quality development of inclusive childcare services. By improving the policy system and strengthening the supervision of service quality, the government promotes the comprehensive development of inclusive childcare services in terms of policies, facilities, talents, etc. In the future development, the government, enterprises and all sectors of society should continue to work together to provide more high-quality and convenient inclusive childcare services for infant and young children in my country, and contribute to meeting the challenges of population aging and promoting the long-term balanced development of the population.

2.3 Existing Problems and Challenges

Under the background of aging and low birth rate, my country's inclusive childcare services face a series of problems and challenges. First, [imbalance between supply and demand] is the key problem facing my country's inclusive childcare services. In the current social environment, the fertility rate is declining, the elderly population is increasing, and the pressure of child support is gradually becoming prominent. However, the supply of inclusive childcare services in my country is far from meeting the growing demand, resulting in many families facing the dilemma of no one to take care of them after giving birth.

Secondly, [service quality] is also a major challenge. Due to the imperfect construction of my country's inclusive childcare service system, some childcare institutions have deficiencies in teachers, facilities, management, etc., making it difficult to provide high-quality services. This has led many parents to take a wait-and-see attitude towards inclusive childcare services, further exacerbating the problem of imbalance between supply and demand.

In addition, insufficient [policy support] is also an important factor restricting the high-quality development of inclusive childcare services. Under the current policy system, inclusive childcare services have received relatively limited policy support, making it difficult to attract more social capital investment. At the same time, there is also a certain degree of lack of government supervision of inclusive childcare services, which has led to difficulties in the standardized operation of some childcare institutions.

Finally, [social concepts] are also a challenge faced by the high-quality development of inclusive childcare services in the context of aging and low birth rates. In traditional Chinese concepts, family care and children's care are the main ways for the elderly to care for their parents, and the concept of social care has not yet been deeply rooted in the hearts of the people. This makes inclusive childcare services face certain resistance in the promotion process, and the elderly have a low acceptance of childcare services.

In short, in the context of aging and low birth rates, the high-quality development of inclusive childcare services in my

country faces many problems and challenges. To solve these problems, it is necessary to start from multiple aspects such as supply and demand balance, service quality, policy support and social concepts to promote the high-quality development of inclusive childcare services in my country.

3 THE CONNOTATION AND CHARACTERISTICS OF INCLUSIVE CHILDCARE SERVICES UNDER THE CONCEPT OF HIGH-QUALITY DEVELOPMENT

In today's society, the problems of aging and low birth rate are becoming increasingly prominent, which has brought a lot of pressure to the majority of families. In this context, the high-quality development of inclusive childcare services is particularly important. This study aims to explore the connotation and characteristics of inclusive childcare services under the concept of high-quality development, and provide theoretical support for relevant policy formulation and industrial development in my country.

[The connotation of inclusive childcare services under the concept of high-quality development]

First, the connotation of inclusive childcare services under the concept of high-quality development is reflected in its livelihood attributes. As a public service, inclusive childcare services aim to meet the fertility needs of the general public, reduce fertility costs, and increase fertility willingness. By improving the inclusive childcare service system, it will help alleviate family fertility pressure and increase family fertility willingness, thereby alleviating the aging problem in my country to a certain extent.

Secondly, inclusive childcare services under the concept of high-quality development have significant social attributes. By providing scientific and standardized upbringing and care for infants and young children aged 0-3, inclusive childcare services can help improve the health level, intellectual development and social adaptability of infants and young children, and lay the foundation for my country's human resources development.

Finally, inclusive childcare services under the concept of high-quality development have strong economic benefits. By improving the quality and coverage of inclusive childcare services and reducing family childbearing costs, it will help stimulate family consumption potential, promote the development of related industrial chains, and thus drive economic growth.

[Characteristics of inclusive childcare services under the concept of high-quality development]

First, fairness. Inclusive childcare services under the background of high-quality development should ensure that all infants and young children can enjoy high-quality and fair childcare services, and eliminate the gap between urban and rural areas, regions, and classes.

Second, sustainability. Inclusive childcare services need to maintain continuous development in terms of policy support, facility construction, and talent training to ensure the stability of service quality and quantity.

Third, diversification. Inclusive childcare services under the background of high-quality development should meet the diverse needs of families and provide childcare services in various forms and at multiple levels to meet the choices of different families.

Fourth, professionalism. Inclusive childcare services under the background of high-quality development need to have a professional service team, use scientific and standardized parenting and care methods, and ensure the healthy growth of infants and young children.

Fifth, intelligence. With the help of modern information technology, inclusive childcare services under the background of high-quality development can achieve information sharing, optimal resource allocation, and refined management, and improve service efficiency and quality.

Sixth, integration. In the context of high-quality development, inclusive childcare services should be combined with family, community, education, medical and other resources to build a comprehensive and full-process infant and child care system.

In short, in the context of aging and low birth rate, the connotation and characteristics of inclusive childcare services under the concept of high-quality development are of great significance to promoting the high-quality development of inclusive childcare services in my country. Through in-depth research and development of relevant policies, my country is expected to achieve more significant results in coping with aging problems, promoting population structure optimization, and promoting economic growth.

3.1 The Connotation and Requirements of High-Quality Development

In the context of an aging population and a declining birthrate, the high-quality development of inclusive childcare services has become an important topic for my country's social and economic development. The connotation and requirements of high-quality development can be elaborated from the following aspects:

First, [policy support and improvement]. In the process of policy formulation and implementation, the government should fully reflect the guidance and support for the high-quality development of inclusive childcare services. This includes increasing fiscal investment, optimizing the policy environment, encouraging social capital participation, and strengthening land and tax incentives. At the same time, improve relevant laws and regulations, clarify the responsibilities of various departments, strengthen supervision, and ensure service quality.

Second, [system construction and optimization]. Build a multi-level and diversified inclusive childcare service system to meet the needs of different families and infants. This includes improving the diversified elderly care service system such as home-based elderly care, community elderly care, and institutional elderly care, as well as promoting the

connection and integrated development between stages such as 0-3-year-old infant care services and 3-6-year-old preschool education.

Third, [service quality and improvement]. Improve the quality of inclusive childcare service personnel, strengthen teacher training, standardize industry standards, and ensure service quality. Focus on the physical and mental health of infants and young children, promote scientific parenting concepts, innovate service models, and provide families with personalized and refined parenting guidance.

In addition, [social participation and coordination]. Stimulate the enthusiasm of social forces to participate in inclusive childcare services, and build a platform for the joint participation of governments, enterprises, social organizations, families and other parties. Encourage enterprises and social organizations to innovate childcare service products, expand service areas, and improve service quality. Strengthen family and social education guidance to increase family recognition and participation in inclusive childcare services.

Finally, [monitoring, evaluation and optimization]. Establish and improve the monitoring and evaluation system for inclusive childcare services, and regularly evaluate service quality, benefits, satisfaction, etc. According to the evaluation results, timely adjust policy orientation and resource allocation, and continuously optimize the inclusive childcare service system.

In the context of aging and low birth rate, only by achieving high-quality development of inclusive childcare services can we better cope with the challenges of population aging and promote the sustained and healthy development of my country's economy and society.

3.2 The Connotation and Characteristics of High-Quality Development of Inclusive Childcare Services

In today's society, the problems of aging and low birth rate are becoming increasingly prominent, and inclusive childcare services have become an important issue facing my country. In this context, it is of practical significance to explore the high-quality development of inclusive childcare services. [The connotation and characteristics of high-quality development of inclusive childcare services] has become the core focus of this study.

First, we need to clarify the connotation of high-quality development of inclusive childcare services. High-quality development of inclusive childcare services means that more families can enjoy reasonably priced, convenient and accessible childcare services on the premise of fully guaranteeing the quality of services. This includes both the reform of traditional childcare models and the innovation of new childcare services. On this basis, improving the quality of childcare services and meeting the diversified needs of parents have become the key.

Secondly, the characteristics of high-quality development of inclusive childcare services are reflected in the following aspects:

- 1) Policy support: The government provides preferential policies for inclusive childcare services in terms of finance, taxation, land, etc., reduces operating costs, and encourages social capital investment.
- 2) Improvement of the service system: Establish and improve a full-service system from pregnancy, postpartum to all stages of infant growth, and improve service quality and satisfaction.
- 3) Teacher training and quality improvement: Strengthen teacher training, improve the quality of practitioners, and ensure that infants and young children are well cared for in inclusive childcare services.
- 4) Family education and community participation: Promote family education and community participation, form a virtuous cycle of family, school and society, and improve the coverage and influence of inclusive childcare services.
- 5) Technological innovation: Use modern scientific and technological means, such as big data and cloud computing, to improve the intelligence and personalization of inclusive childcare services.
- 6) Optimization of the supervision and evaluation system: Establish and improve the supervision and evaluation system, ensure the quality and safety of inclusive childcare services, and enhance the trust of parents and society.

Against the background of aging and low birth rate, high-quality development of inclusive childcare services will help ease family fertility pressure, improve population quality and promote social harmony. To achieve this goal, the government, enterprises, social organizations and individuals need to work together to create a good growth environment for the next generation of our country.

3.3 Path Selection for High-Quality Development

In today's society, the problems of aging and low birth rate are becoming increasingly serious, which has brought many challenges to my country's economic and social development. Against this background, high-quality development of inclusive childcare services has become an urgent need. This article explores the path selection for high-quality development from the following aspects.

First, we need to clarify the definition and connotation of inclusive childcare services. Universal childcare services refer to the provision of safe, reliable and high-quality care services for infants and young children aged 0-3 years old through government guidance, market mechanisms and participation of social forces, with the purpose of meeting the basic needs of the general public. In this process, the government, market, society and family each play different roles.

Secondly, we need to analyze the current situation and problems of the development of universal childcare services under the background of aging and low birth rate. At present, the imbalance between supply and demand, uneven quality and shortage of teachers in my country's universal childcare services are becoming increasingly prominent. These problems have imposed a considerable burden on families and society, and have also affected the implementation

of the country's population strategy.

Next, this article will propose the path selection of high-quality development from the four levels of policy, market, society and family. First, the government should increase its support for universal childcare services at the policy level, improve relevant laws and regulations, clarify the responsibilities of various departments, increase fiscal investment, guide social capital participation, implement preferential policies, and promote the construction of a universal childcare service system.

Secondly, at the market level, it is necessary to cultivate a diversified and competitive childcare market, break discrimination in terms of region, gender, income, etc., and improve service quality and satisfaction. At the same time, we should strengthen the supervision of childcare institutions, standardize the market order, prevent vicious competition, and ensure the sustainable development of inclusive childcare services.

Furthermore, at the social level, we should give full play to the role of social organizations and enterprises, innovate inclusive childcare service models, broaden service channels, and improve service accessibility. At the same time, we should strengthen social supervision and improve the public's awareness and satisfaction with inclusive childcare services.

Finally, at the family level, we should increase family fertility intentions, advocate scientific parenting concepts, and promote family harmony. The government should increase support for families, such as increasing fertility subsidies and expanding parental leave policies, so as to reduce fertility costs and make more families willing to give birth.

In short, in the context of aging and low birth rates, high-quality development of inclusive childcare services is an important task for the country and the family. We should work together at the four levels of policy, market, society and family to explore a path for high-quality development of inclusive childcare services that is in line with my country's national conditions. This will be of great significance to alleviating the problem of aging and low birth rates in my country, promoting the optimization of population structure, and achieving sustainable economic and social development.

4 EXPLORATION OF THE MODEL OF HIGH-QUALITY DEVELOPMENT OF INCLUSIVE CHILDCARE SERVICES UNDER THE BACKGROUND OF AGING AND LOW BIRTH RATE

In the context of my country facing severe challenges of aging and low birth rate, the high-quality development of inclusive childcare services has received increasing attention. [Exploration of the model of high-quality development of inclusive childcare services under the background of aging and low birth rate] aims to propose an innovative solution to this problem. This paper first analyzes the causes of the phenomenon of aging and low birth rate in my country and its impact on the social economy, and then sorts out the development status of inclusive childcare services and points out the current problems. Next, this paper explores the model of high-quality development of inclusive childcare services under the background of aging and low birth rate from multiple perspectives such as policy, market, and society.

First, at the policy level, the government should increase its support for inclusive childcare services, guide and encourage social capital investment by improving the relevant policy system, and improve the supply level of inclusive childcare services. Secondly, at the market level, it is necessary to innovate service models to meet diversified needs. By developing diversified forms of childcare services, improving service quality, and enhancing people's trust in inclusive childcare services. In addition, at the level of social organizations, we should strengthen cooperation with families and communities, build a comprehensive and multi-level childcare service system, and benefit more families.

On this basis, this paper proposes a high-quality development model of inclusive childcare services under the background of aging and low birth rate, with "policy guidance, market operation, and social participation" as the core. This model emphasizes the synergy of government, market, and society, and aims to provide new ideas for the development of inclusive childcare services in my country. Finally, this paper verifies the proposed model based on domestic and foreign practical cases, and analyzes its feasibility in promoting the high-quality development of inclusive childcare services under the background of aging and low birth rate.

In short, under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country requires the joint efforts of multiple parties and innovative models. Through the organic combination of policy guidance, market operation, and social participation, it is expected to lay the foundation for solving the problem of aging and low birth rate in my country and promoting social harmony and sustainable economic development.

4.1 Policy Support and Innovation

In the context of my country's aging and low birth rate, the high-quality development of inclusive childcare services is particularly important. Policy support and innovation are key factors in promoting the development of this field. In terms of [policy support], the government should increase investment in inclusive childcare services, improve relevant laws and regulations, and ensure that policies are implemented and effective. In addition, [innovation] is also an indispensable part, including innovative service models, improving service quality, and broadening financing channels.

First, in terms of policy support, the government should clarify the positioning of inclusive childcare services, incorporate them into the national development strategy, and increase support for public and private inclusive childcare institutions. Through policy measures such as tax cuts, fee reductions, subsidies, and preferential loans, guide social capital to invest in the field of inclusive childcare, and improve the accessibility and satisfaction of inclusive childcare services. At the same time, improve the regulatory mechanism, ensure service quality, and maintain market order.

Secondly, in terms of innovation, it is necessary to explore diversified service models to meet the needs of different families. For example, develop various forms such as family childcare, community childcare, and corporate childcare to provide parents with flexible and diverse choices. At the same time, improve the quality of practitioners, strengthen teacher training, and improve the quality of childcare services. In addition, use modern scientific and technological means, such as big data and artificial intelligence, to optimize management processes and improve service efficiency.

Finally, in terms of broadening financing channels, we can learn from international experience and develop financial products such as inclusive childcare industry funds and special bonds to provide long-term and stable financial support for inclusive childcare services. At the same time, we should encourage the participation of social welfare and charity to form a diversified financing system with the participation of government, enterprises and society.

In short, under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country needs to rely on the dual drive of policy support and innovation. By improving the policy system, improving service quality, broadening financing channels and other measures, it is expected to achieve leapfrog development of inclusive childcare services and bring benefits to families and society.

4.2 Construction and Development of Service System

Under the background of aging and low birth rate, inclusive childcare services in my country face huge development challenges. In order to meet this challenge, this study focuses on the construction and development of the service system and discusses the following aspects:

- 1) The current status of inclusive childcare services under the background of aging and low birth rate: Analyze the impact of the aging and low birth rate phenomenon in my country on the demand for inclusive childcare services, and the shortcomings of the existing service system in meeting these needs.
- 2) Theoretical basis for the construction of a universal childcare service system: From the perspectives of policy, economy, society and culture, this paper expounds the important theoretical basis for the construction of a high-quality universal childcare service system.
- 3) Framework design of universal childcare service system: Based on the theoretical basis, this paper proposes a systematic and comprehensive universal childcare service system framework, including core elements such as service content, service model, service facilities, and service quality assurance.
- 4) Service system development strategy and policy recommendations: In view of the outstanding problems in the development of my country's universal childcare service system, this paper proposes a series of specific development strategies and policy recommendations to promote the high-quality development of the service system.
- 5) Case analysis and practical exploration: Several representative universal childcare service cases are selected to analyze their successful experiences and shortcomings, so as to provide practical reference for the high-quality development of my country's universal childcare service system.
- 6) Conclusion and prospect: This paper summarizes the research viewpoints of the full text and looks forward to the development trend of my country's universal childcare service system in the future, in order to provide useful reference for policy makers and practitioners.

This study hopes to provide theoretical support and practical guidance for my country to achieve high-quality development of universal childcare services under the background of aging and low birth rate through in-depth discussion of the construction and development of the service system.

4.3 Improvement of Service Quality and Efficiency

Faced with the challenges of aging and low birth rate, my country's universal childcare services face many difficulties. How to improve service quality and efficiency has become a key issue. Improving service quality and efficiency is the core of promoting high-quality development of universal childcare services, which is related to the welfare of infants and families.

First of all, improving service quality requires starting from the following points: ① Improve relevant policies and regulations, clarify the responsibilities and rights of the government, market, society and family in universal childcare services; ② Strengthen teacher training, improve the quality of practitioners, and ensure that infants and young children receive professional and standardized care in childcare institutions; ③ Strengthen infrastructure construction, improve the hardware level of universal childcare institutions, and provide infants and young children with a safe and comfortable growth environment.

Secondly, the following points should be paid attention to in order to improve benefits: ④ Optimize resource allocation, innovate service models, increase the coverage of inclusive childcare services, and meet the needs of more families; ⑤ Reduce operating costs, improve operating efficiency, and enhance the competitiveness of inclusive childcare services; ⑥ Strengthen publicity and promotion, improve social awareness and satisfaction with inclusive childcare services, and enhance the reputation and brand effect of institutions.

In addition, cross-departmental collaboration, deepening international cooperation and exchanges, and learning from the successful experience of developed countries in inclusive childcare services will provide strong support for the high-quality development of inclusive childcare services in my country.

In short, under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country needs to focus on improving service quality and benefits, and provide more high-quality and convenient

inclusive childcare services for infants and families through improving policies, optimizing resources, strengthening training, and reducing costs, so as to help implement my country's population development strategy.

4.4 The Importance of Social Participation and Coordination

At a time when my country is facing the problems of aging and low birth rate, it is imperative to promote the high-quality development of inclusive childcare services. The participation and coordination of social forces are the key to achieving this goal. This paper first discusses the current situation of inclusive childcare services under the background of aging and low birth rate in my country, and reveals the challenges and problems faced therein. Then, from the perspective of social participation and coordination, it discusses how to promote the high-quality development of inclusive childcare services.

On the one hand, the government should increase its guidance and support for social forces, encourage social capital to invest in the field of inclusive childcare, and realize the organic integration of public services and market services. On the other hand, social forces should play an active role, innovate service models, improve service quality, and meet the diversified childcare needs of families. In addition, the participation of social forces can also be reflected in policy advocacy, public opinion guidance, education and training, etc., to comprehensively improve the development level of inclusive childcare services.

To achieve this goal, this article proposes the following suggestions: First, improve relevant policies and regulations to provide strong guarantees for social forces to participate in inclusive childcare services; second, strengthen publicity and promotion to enhance social awareness and recognition of inclusive childcare services; third, establish and improve the regulatory system to ensure service quality; finally, strengthen talent training and improve the professional quality of practitioners.

In short, under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country requires the participation and coordination of social forces. Through the joint efforts of the government, enterprises, social organizations and individuals, my country's inclusive childcare services are expected to achieve high-quality development and bring benefits to families and society.

Faced with the challenges of aging and low birth rate, my country's inclusive childcare services face many difficulties, and how to improve service quality and efficiency has become a key issue. Improving service quality and efficiency is the core of promoting the high-quality development of inclusive childcare services, which is related to the welfare of infants and families.

First, improving service quality requires the following points: ① Improve relevant policies and regulations, clarify the responsibilities and rights of the government, market, society and family in inclusive childcare services; ② Strengthen teacher training, improve the quality of practitioners, and ensure that infants and young children receive professional and standardized care in childcare institutions; ③ Strengthen infrastructure construction, improve the hardware level of inclusive childcare institutions, and provide infants and young children with a safe and comfortable growth environment.

Secondly, improving benefits requires the following points: ④ Optimize resource allocation, innovate service models, increase the coverage rate of inclusive childcare services, and meet the needs of more families; ⑤ Reduce operating costs, improve operating efficiency, and enhance the competitiveness of inclusive childcare services; ⑥ Strengthen publicity and promotion, improve social awareness and satisfaction with inclusive childcare services, and enhance the reputation and brand effect of institutions.

In addition, cross-departmental collaboration, deepening international cooperation and exchanges, and learning from the successful experience of developed countries in inclusive childcare services will provide strong support for the high-quality development of my country's inclusive childcare services.

In short, under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country needs to focus on improving service quality and benefits. By improving policies, optimizing resources, strengthening training, and reducing costs, we can provide infants and families with better quality and more convenient inclusive childcare services, and help implement my country's population development strategy.

Faced with the challenges of aging and low birth rate, my country's inclusive childcare services face many difficulties. How to improve service quality and benefits has become a key issue. Improving service quality and benefits is the core of promoting the high-quality development of inclusive childcare services, which is related to the well-being of infants and families.

First of all, improving service quality requires starting from the following points: ① Improve relevant policies and regulations, clarify the responsibilities and rights of the government, market, society and families in inclusive childcare services; ② Strengthen teacher training, improve the quality of practitioners, and ensure that infants and children receive professional and standardized care in childcare institutions; ③ Strengthen infrastructure construction, improve the hardware level of inclusive childcare institutions, and provide infants and children with a safe and comfortable growth environment.

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inclusive childcare services, and enhance the reputation and brand effect of institutions.

In addition, cross-departmental collaboration, deepening international cooperation and exchanges, and learning from the successful experience of developed countries in inclusive childcare services will provide strong support for the high-quality development of inclusive childcare services in my country.

In short, under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country needs to focus on improving service quality and benefits, and provide infants and families with more high-quality and convenient inclusive childcare services through improving policies, optimizing resources, strengthening training, and reducing costs, so as to help implement my country's population development strategy.

5 POLICY RECOMMENDATIONS FOR THE HIGH-QUALITY DEVELOPMENT OF INCLUSIVE CHILDCARE SERVICES UNDER THE BACKGROUND OF AGING AND LOW BIRTH RATE

In the current social background of aging and low birth rate, the high-quality development of inclusive childcare services is particularly important. [Policy recommendations for high-quality development of inclusive childcare services under the background of aging and low birth rate] aims to put forward a series of policy recommendations to meet the challenges brought about by changes in my country's population structure and promote high-quality development of inclusive childcare services.

Improve the policy and regulatory system

- 1) Formulate and improve laws and regulations on inclusive childcare services, and clarify the responsibilities and rights of the government, market, society and family in inclusive childcare services.
- 2) Strengthen supervision of inclusive childcare service institutions to ensure service quality and protect the rights and interests of infants and parents.

Increase financial support

- 1) Increase the financial subsidy standard for inclusive childcare services and reduce family raising costs.
- 2) Increase support for public and private inclusive childcare institutions and encourage more social capital to invest in the field of inclusive childcare services.

Optimize resource allocation

- 1) Rationally plan inclusive childcare service facilities according to the proportion of urban and rural populations and increase service coverage.
- 2) Strengthen support for inclusive childcare services in various forms such as communities and families to meet the diverse raising needs of parents.

Improve the quality of talent training

- 1) Strengthen the training of professional talents in infant and child care and improve the quality of teachers.
- 2) Encourage in-service personnel to participate in relevant training to improve the overall level of inclusive childcare services.

Strengthen publicity and promotion

- 1) Increase the publicity of inclusive childcare services and improve parents' awareness and satisfaction with inclusive childcare services.
- 2) Set up models, promote successful experiences and models, and promote the high-quality development of inclusive childcare services.

Strengthen departmental coordination

- 1) Establish and improve a multi-departmental coordination mechanism, form a policy synergy, and promote the high-quality development of inclusive childcare services.
- 2) Strengthen policy tracking and evaluation, and adjust and improve policy measures in a timely manner.

Through the implementation of the above policy recommendations, it is expected to promote the high-quality development of inclusive childcare services in my country under the background of aging and low birth rate, and bring benefits to families and society.

5.1 Improve the Policy System and Legal System

In today's aging and low birth rate context, my country's inclusive childcare services face huge challenges. In order to achieve high-quality development, we must improve the policy system and legal system. In this process, the government should give full play to its guiding role, increase support for inclusive childcare services, innovate service models, improve service quality, and ensure that the majority of families receive practical support.

First, we must improve relevant policies to provide strong guarantees for inclusive childcare services. The government should clarify policy goals, strengthen policy implementation, and ensure that policies take root. At the same time, we must fully mobilize the enthusiasm of all sectors of society, encourage social capital to invest in the field of inclusive childcare, and promote diversified development.

Second, strengthen the construction of laws and regulations to ensure the standardized operation of inclusive childcare services. The government should establish and improve the supervision mechanism, clarify the responsibilities of various departments, and strengthen the supervision of inclusive childcare service institutions. At the same time, it is necessary to improve the service quality evaluation system to protect the rights and interests of infants and their families.

Third, innovate service models and improve the quality of inclusive childcare services. The government should promote the combination of production, learning, research and application, and encourage scientific research institutions, enterprises, social organizations, etc. to participate in the construction of inclusive childcare service system. By promoting advanced technologies and optimizing service content, we can improve service efficiency and meet the diverse needs of families.

In addition, we must strengthen talent training and improve the quality of inclusive childcare service personnel. The government should improve the talent training system, increase the training of relevant professional talents, and improve the quality of teachers. At the same time, it is necessary to strengthen the training of in-service personnel and improve the quality of service.

Finally, strengthen publicity and promotion to enhance the public's awareness and satisfaction with universal childcare services. The government should increase publicity efforts, popularize scientific parenting knowledge, and enhance parents' recognition of universal childcare services. Through multi-channel publicity, more families can enjoy high-quality and convenient universal childcare services.

In short, under the background of aging and low birth rate, the high-quality development of universal childcare services in my country requires the improvement of policy systems and regulations. The government should give full play to its guiding role, innovate service models, improve service quality, and provide practical support for the majority of families. By strengthening policies, regulations, talent training, publicity and promotion, we will promote my country's universal childcare services to a higher level.

5.2 Increase Fiscal Investment and Tax Incentives

In the context of an aging population and a declining birthrate in my country, the high-quality development of inclusive childcare services is particularly important. In order to promote the development of this field, the government can take measures to increase fiscal investment and tax incentives.

First, in terms of fiscal investment, the government should increase financial support for inclusive childcare services. This includes investment in infrastructure construction, equipment purchase, and personnel training for childcare institutions. In addition, special funds can be set up to support the development of innovative inclusive childcare service projects. For local governments, their fiscal investment in the field of inclusive childcare services can be included in the assessment system to ensure that all localities attach importance to inclusive childcare services.

Second, in terms of tax incentives, the government can provide tax reduction and exemption policies for inclusive childcare service institutions. For example, the VAT, corporate income tax and other taxes that they need to pay can be reduced or exempted. This will help reduce the operating costs of inclusive childcare services and make them more competitive. At the same time, the government can also consider giving tax incentives to enterprises, institutions and individuals that provide inclusive childcare services to encourage more social forces to invest in this field.

In addition, the government should also improve relevant laws and regulations to ensure that fiscal investment and tax incentives are implemented in place. This includes clarifying the responsibilities of governments at all levels, regulating the inclusive childcare service market, and strengthening supervision of inclusive childcare service institutions. At the same time, the government needs to strengthen communication and cooperation with all sectors of society to jointly promote the high-quality development of inclusive childcare services.

In short, in the context of aging and low birth rates, increasing fiscal investment and tax incentives are important means to promote the high-quality development of inclusive childcare services. The government should give full play to its role in policy formulation, capital investment and market supervision, and work together with all sectors of society to create a good environment for the development of inclusive childcare services in my country.

5.3 Optimizing the Service System and Talent Training

In the context of aging and low birth rates in my country, the high-quality development of inclusive childcare services is particularly important. In order to achieve this goal, we need to optimize the service system and talent training.

First, in terms of the service system, the government should increase policy support for inclusive childcare services, encourage social capital investment, and promote the development of diversified service models. At the same time, it is necessary to strengthen supervision, ensure service quality, and provide parents with a rich variety of inclusive childcare service options. In addition, a sound evaluation system for inclusive childcare services should be established to meet the needs of different age groups and families and improve service quality.

Secondly, in terms of talent training, we need to strengthen the construction of the teaching staff and improve the quality of practitioners. On the one hand, we should improve relevant talent training policies to attract more outstanding talents to join the inclusive childcare industry. On the other hand, we should strengthen the training and promotion mechanism of in-service personnel and improve the comprehensive quality of in-service personnel. In addition, we can also introduce advanced foreign educational concepts and talent training models through international cooperation to provide strong support for my country's inclusive childcare services.

On this basis, we should also pay attention to the participation of families and society. By strengthening the popularization of family education concepts, we can improve parents' recognition and satisfaction with inclusive childcare services. At the same time, we should encourage social forces to participate in inclusive childcare services and form a development pattern in which the government, enterprises and society participate together.

In short, under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country requires the optimization of service systems and talent training. Through policy support, quality supervision, teacher team building and other efforts, we can provide families with high-quality and diversified inclusive childcare services and help my country's infant and child care industry flourish.

5.4 Promote Marketization and Diversified Development

In today's society, the problems of aging and low birth rate are becoming more and more serious. Therefore, the high-quality development of inclusive childcare services has attracted more and more attention. In promoting marketization and diversified development, my country can take the following measures:

First, improve the policy system. The government should formulate a series of policies to support and guide social capital to invest in the field of inclusive childcare services and promote the cultivation and development of market entities. At the same time, strengthen policy publicity to improve the awareness and acceptance of inclusive childcare services by all sectors of society.

Secondly, innovate service models. On the basis of ensuring basic public services, encourage social forces to participate and carry out diversified and personalized childcare services. For example, promote the development of various forms such as family childcare, community childcare, and corporate childcare to meet the diversified needs of different groups for childcare services.

Thirdly, strengthen talent training. Improve the professional quality and service capabilities of childcare personnel and establish a complete training and assessment system. At the same time, increase the training of professional talents and attract more outstanding talents to join the inclusive childcare service industry.

In addition, strengthen supervision and service quality assurance. Government departments should strengthen supervision of the inclusive childcare service market, standardize service behaviors, and ensure service quality. Establish and improve a service quality evaluation system, regularly evaluate service agencies, and improve the overall service level.

Finally, strengthen international cooperation and exchanges. Learn from the successful experience of developed countries in the field of inclusive childcare services to promote the high-quality development of inclusive childcare services in my country. Through international cooperation and exchanges, enhance my country's competitiveness in the field of inclusive childcare services.

In short, under the background of aging and low birth rate, promoting marketization and diversified development is an important way to achieve high-quality development of inclusive childcare services. Only through continuous innovation and active exploration can we provide the broad masses of people in my country with more high-quality and convenient inclusive childcare services.

5.5 Strengthen Publicity and Promotion and Social Supervision

Under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country is particularly important. In order to achieve this goal, strengthening publicity and promotion and social supervision has become an indispensable means. [Improvement of publicity and promotion strategies] First, the government should increase policy publicity efforts to improve the awareness and acceptance of inclusive childcare services in the whole society. By holding various publicity activities and making full use of new media platforms, more families can understand and recognize inclusive childcare services. In addition, [Build a diversified publicity matrix] The government can also unite enterprises, social organizations and other forces to jointly carry out publicity and promotion work, form a diversified publicity matrix, and expand the influence of inclusive childcare services.

[Construction of social supervision mechanism] At the same time, it is also crucial to establish a sound social supervision mechanism. The government should take the initiative to disclose relevant policies, implementation status and other information of inclusive childcare services to facilitate public supervision. In addition, [Introduce third-party evaluation] Consider introducing a third-party evaluation agency to conduct regular evaluations on the quality and benefits of inclusive childcare services, and use the evaluation results as the basis for adjusting policies and optimizing services. [Encourage social participation] Encourage all sectors of society to actively participate in supervision, put forward constructive opinions and suggestions on inclusive childcare services, and promote the improvement of service quality.

[Case sharing and experience promotion] In the process of publicity and promotion and social supervision, the enthusiasm of local exploration and innovation can be stimulated by sharing successful cases and experiences. Localities can learn from successful experiences based on their actual conditions and build an inclusive childcare service system with local characteristics. At the same time, [International Exchange and Cooperation] Strengthen exchanges and cooperation with the international community, introduce advanced management concepts and technologies from abroad, and provide strong support for the high-quality development of my country's inclusive childcare services.

6 CONCLUSION

In short, under the background of aging and low birth rate, the high-quality development of my country's inclusive childcare services needs to rely on publicity and promotion and social supervision. By improving publicity and

promotion strategies, building social supervision mechanisms, sharing cases and experiences, and strengthening international exchanges and cooperation, it is expected to promote my country's inclusive childcare services to a higher level.

Under the background of aging and low birth rate, my country's inclusive childcare services face many challenges, such as service quality, teaching staff, and policy support. This paper analyzes the current development status of my country's inclusive childcare services, reveals the problems, and proposes a strategy for high-quality development on this basis. First, the educational quality of inclusive childcare services should be improved. The government should increase support for high-quality inclusive childcare institutions, encourage them to play a leading role in demonstration, and drive the overall improvement of service quality. At the same time, improve relevant laws and regulations, standardize the management of inclusive childcare service institutions, and ensure service quality. Secondly, strengthen the construction of the teaching staff. Increase investment in childcare staff training, improve teacher treatment, and attract more outstanding talents to join the childcare industry. At the same time, establish a complete teacher assessment and evaluation system to improve teachers' education and teaching level. Third, improve the policy support system. The government should increase financial support for universal childcare services, reduce family childbearing costs, and increase childbearing willingness. At the same time, optimize preferential policies such as land and taxation, and encourage social capital to invest in universal childcare services. Finally, strengthen publicity and promotion. Through multi-channel and multi-level publicity, improve the public's awareness and satisfaction with universal childcare services, and create a good social atmosphere for high-quality development. In short, under the background of aging and low birth rate, the high-quality development of my country's universal childcare services needs to start from service quality, teacher team, policy support and other aspects, build a complete system, provide families with better quality and more convenient childcare services, and help my country's population development strategy.

6.1 The Necessity of High-Quality Development of Universal Childcare Services under the Background of Aging and Low Birth Rate

Under the background of aging and low birth rate, my country is facing problems such as unbalanced population structure and declining fertility willingness. 【The necessity of high-quality development of inclusive childcare services under the background of aging and low birth rate】 is particularly prominent in this context. This paper aims to explore the necessity of high-quality development of inclusive childcare services in my country under the background of aging and low birth rate, and how to promote its high-quality development.

First, under the background of aging and low birth rate, inclusive childcare services in my country face tremendous pressure. With the changes in family structure, traditional family childcare methods can no longer meet social needs. Therefore, the government and all sectors of society are increasingly aware of the importance of developing inclusive childcare services.

Second, high-quality development of inclusive childcare services can help alleviate fertility pressure. Against the background of rising childbirth costs, it has become a top priority to reduce the family's fertility burden and increase the willingness to have children. By developing inclusive childcare services, affordable childcare support can be provided to families, thereby increasing the willingness to have children.

Third, high-quality development of inclusive childcare services can help improve the overall quality of my country's population. High-quality childcare services can ensure that infants and young children are well cared for and lay the foundation for their physical and mental development. This will be conducive to improving the quality of my country's population and providing talent support for the country's future development.

Finally, high-quality development of inclusive childcare services can help achieve sustainable economic and social development in my country. Infant and child care services are an important part of the labor market. The development of inclusive childcare services is conducive to women's employment and increases the labor force participation rate, thereby promoting economic and social development.

In summary, under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country is of great necessity. In order to achieve this goal, the government should increase policy support, innovate service models, improve service quality, broaden funding sources, encourage social forces to participate, and jointly promote the high-quality development of inclusive childcare services in my country.

6.2 The Effectiveness and Shortcomings of Current Policy Practice

Under the background of aging and low birth rate in my country, the high-quality development of inclusive childcare services has become the focus of social attention. In recent years, the government has attached great importance to this and has achieved certain results in policy practice. However, at the same time, the effectiveness and shortcomings of current policy practice are becoming increasingly prominent.

First, from the policy level, my country has issued a series of policy measures on inclusive childcare services, such as increasing support for inclusive childcare institutions and raising the standard of family fertility subsidies. These policies have promoted the development of inclusive childcare services to a certain extent and provided more fertility support for families. However, the coverage and implementation of the policy still need to be improved. In actual operation, many families have not enjoyed the benefits brought by relevant policies, which makes it impossible to effectively alleviate the problem of aging and low birth rate.

Secondly, in terms of service quality, although my country's inclusive childcare services have made certain progress, there is still a big gap compared with developed countries. On the one hand, the number of inclusive childcare institutions in my country is insufficient to meet the needs of the majority of families. On the other hand, the service levels of existing inclusive childcare institutions are uneven, and some institutions have obvious shortcomings in terms of teachers, facilities, and management level, which makes parents face great troubles when choosing inclusive childcare services.

Thirdly, from the perspective of social concepts, although the Chinese government actively advocates the high-quality development of inclusive childcare services, traditional concepts still have certain constraints on family fertility and infant care. Many parents still believe that the care capacity within the family is better than that of external institutions, so the demand for inclusive childcare services is not strong. In addition, the low level of social awareness of inclusive childcare services has also affected the support and participation of families in relevant policies.

In summary, under the background of aging and low birth rate, the high-quality development of inclusive childcare services in my country still faces many challenges. In order to further promote the development of inclusive childcare services, the government and all sectors of society should work together to provide families with better quality and more convenient inclusive childcare services from the aspects of policy improvement, service quality improvement, and social concept change. This will help alleviate the problem of aging and low birth rate in my country, promote the optimization of population structure and sustainable development of society.

6.3 Future Research Directions and Policy Orientations

In the context of aging and low birth rate in my country, the high-quality development of inclusive childcare services has become an important measure to cope with changes in population structure. Future research directions and policy orientations should focus on the following aspects:

First, in-depth research on family demand and market supply. Understand the actual needs of families in the process of childcare, including childcare time, childcare costs, and childcare service quality, so as to improve the supply of inclusive childcare services in a targeted manner. At the same time, analyze the market competition in the field of inclusive childcare services to ensure the steady improvement of service quality.

Second, actively explore diversified childcare service models. On the basis of existing childcare institutions, encourage social forces to participate and innovate childcare service forms, such as family childcare, corporate childcare, and community childcare. In addition, we should strengthen exchanges and cooperation with the international community, learn from the successful experience of developed countries in universal childcare services, and provide new ideas for universal childcare services in my country.

Third, strengthen policy support and guarantees. The government should give preferential policies to universal childcare service institutions in terms of finance, taxation, land, etc., lower the market entry threshold, and encourage more companies to invest in the field of universal childcare services. At the same time, improve relevant laws and regulations to protect the rights and interests of infants and parents.

Fourth, attach importance to talent training and team building. Strengthen the training of childcare personnel, improve their professional quality and service capabilities, and ensure that infants and young children are well cared for in universal childcare service institutions. In addition, establish and improve incentive mechanisms to attract more outstanding talents to join the universal childcare service industry.

Fifth, strengthen monitoring and evaluation. Establish a complete universal childcare service monitoring and evaluation system, and conduct regular evaluations on the service quality and parent satisfaction of service institutions to ensure the high-quality development of universal childcare services.

Finally, strengthen publicity and promotion. Through various channels, publicize the relevant policies, high-quality institutions and successful cases of universal childcare services, improve parents' awareness and acceptance of universal childcare services, and form a good social atmosphere.

In short, in the context of an aging population and a declining birthrate, the high-quality development of inclusive childcare services in my country requires concerted efforts from multiple aspects. Through in-depth research, policy support, model innovation, talent training, monitoring and evaluation, and publicity and promotion, we will provide more high-quality and convenient inclusive childcare services for families with infants and young children in my country.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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UNDERSTANDING YOUR OWN TEMPERAMENT: CREATING A FOUNDATION FOR NURSES TOWARD POSITIVE AND RESPECTFUL INTERACTIONS WITH PATIENTS AND OTHERS

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Abstract: The first step toward understanding oneself and others is through temperament and despite the core values of a nurse, which include; human dignity, integrity, autonomy, altruism, and social justice, numerous public misconceptions exist regarding nurses. They are often unfairly claimed to be rude, arrogant, lacking manners, and deficient in building human relationships and empathy with their patients and others. The paper highlight the four basic temperament and how one can analyze his/her own temperament with a view of exploring the ways nurses can relate in a positive and respectful interactions with patients and others regardless of their temperament. The article recommend integrating the comprehension of one's own temperament and understanding why people act (behave) the way they do into nursing practice as this will provide a foundation aimed not only at enhancing the quality of care but also fostering healthier relationships between nurses and patients.

Keywords: Temperament; Nurses; Patients; Relationship

1 INTRODUCTION

Temperament is the main reason why we act the way we do and why we do what we do, its influences everything we do including the way we get along with other people. The traits of temperament are mostly innate traits that we are born with, although an individual's family, culture or their experiences can influence them. A person's temperament style plays a role in how they behave and interact with other people and within their world [1].

The first step toward understanding oneself and others is through temperament, as stated by William James. He proposed that the art of life lies in our ability to manage our temperament. Nursing profession is one that requires not only technical expertise but also a profound understanding of human behavior and interaction. As healthcare providers, nurses play a pivotal role in facilitating positive and respectful interactions with patients. The nature of nurse-patients' relationship in healthcare settings is pivotal in ensuring good and efficient healthcare delivery [2].

Despite the core values of a nurse, which include human dignity, integrity, autonomy, altruism, and social justice[3], numerous public misconceptions exist regarding Nigerian nurses. They are often unfairly claimed to be rude, arrogant, lacking manners, and deficient in building human relationships and empathy with their patients and others.

This paper will cover the four basic types of temperament, how you can analyze your own temperament and others, the importance to nurses, and suggest ways in which nurses can relate in a positive and respectful interaction with patients and others regardless of their temperament, as balanced temperament is the key to a peaceful and fulfilling life.

2 LITERATURE REVIEW ON FOUR (4) BASIC TEMPERAMENT TYPES

The heart of the temperament theory, as first conceived by Hippocrates over twenty-four hundred years ago, divides people into four basic categories, namely:

1. Sanguine
2. Choleric
3. Melancholy, and
4. Phlegmatic.

Each temperament type has both strengths and weaknesses that form a distinct part of ones makeup throughout life. Once a person diagnoses his own basic temperament, he is better equipped to ascertain what vocational opportunities he is best suited for and what natural weaknesses he must work on to keep from short-circuiting his potential and creativity [4].

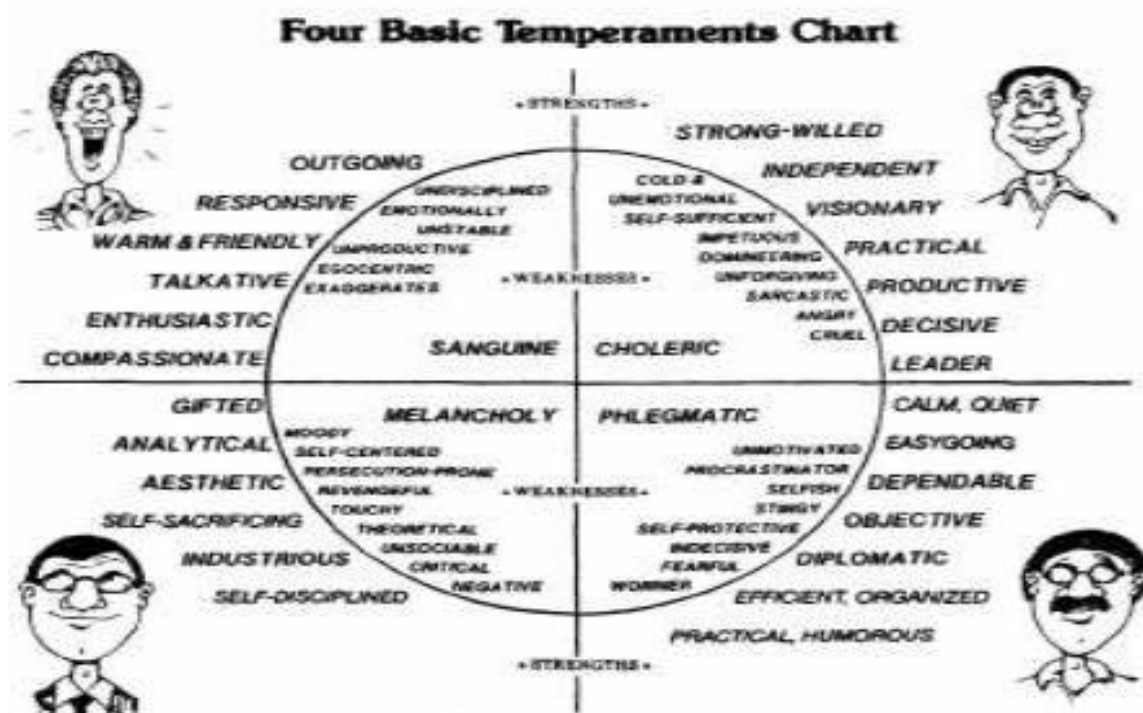


Figure 1 Temperament Chart

Source: TimLahaye.com

2.1 Sanguine (The “Populous Sanguine”)

Sanguine is a warm, buoyant, cheerful, and "enjoying" individual. Because he is naturally receptive, external influences easily make their way to his heart, causing an eruption of response. Sanguine is often referred to as a super extrovert due to his outgoing personality. They have an uncommon capacity for enjoying himself and usually passes on his fun loving energy. When they enter a room, they tend to brighten the spirits of everyone present by his lively chat. They are fascinating storytellers, and his warm, emotive demeanor nearly allows you to relive the incident as he describes it. Sanguine never lacks friends. They truly understand the pleasures and sufferings of those they encounter and have the ability to make him feel significant, as if they were a very precious friend. Their innate abilities will also benefit them if they choose occupations in marketing, travel, fashion, cooking, or sports[4].

Strengths: adventurous, creative, and just plain likable; thrives on social interactions and sharing life with others[5].

Weaknesses: May struggle with follow-through and gets easily over-committed; can lack self-control or tend to avoid the tougher parts of life and relationships[5].

2.2 Choleric (The “Powerful Choleric”)

Choleric is hot, swift, active, practical, strong-willed, self-sufficient, and extremely independent. He has a definite and opinionated personality and finds it easy to make decisions for himself and others. Choleric, like Sanguine, is an extrovert, albeit not as intense. Choleric thrives in activity. Their unwavering dedication typically leads them to achieve where others have failed. Mr. Choleric's emotional nature is the least developed aspect. They do not readily relate with others, nor do they naturally show or express compassion. They are frequently embarrassed or repulsed by the cries of others and are generally oblivious to their needs. They show little appreciation for music and fine arts, unless his secondary temperament qualities are sad. They invariably seek utilitarian and constructive ideals in life. The choleric, who prefers swift, almost intuitive appraisal over analysis, tends to focus at the goal for which they are working without considering the potential traps and barriers in the route. They have a dominant and demanding personality and are not afraid to utilize others to achieve their goals. Choleric individuals excel in roles that involve leadership, decision-making, and strategic thinking. Ideal career fields for them include management, technology, statistics, engineering, programming, and business, where their dynamic and driven nature can thrive[4].

Strengths: A born leader with energy, enthusiasm, and a strong will, self-confident and optimistic.

Weaknesses: May struggle with being empathetic to others' needs, and can tend toward being controlling and overly critical of others [5].

2.3 Melancholic (The "Perfectionist Melancholic")

Melancholy is the richest of all temperaments. They are analytical, selfless, gifted, perfectionists with a highly sensitive emotional character. Nobody enjoys the beautiful arts more than the gloomy. They are naturally introverted; nevertheless, because their feelings take precedence, they are prone to a range of mood swings. They will occasionally lift people to ecstatic heights, causing them to become more outgoing. However, at times, they will be gloomy and unhappy, and during these moments, they will withdraw and become aggressive.

Melancholic individuals are highly sociable and driven by a strong desire to positively impact their community. Their meticulous nature and attention to detail make them exceptional managers with commendable interpersonal skills. Ideal career paths for those with a melancholic temperament include roles in management, accounting, social work, and administration, where their precision and dedication can shine[4].

Strengths: Naturally skilled at keeping things organized and humming along smoothly; a faithful friend who connects deeply with people.

Weaknesses: May struggle with perfectionism or negativity (of self and others); and can be easily overwhelmed by life [5].

2.4 Phlegmatic (The "Peaceful Phlegmatic")

A phlegmatic personality is typically social. Phlegmatic people value interpersonal harmony and tight relationships, which makes them faithful spouses and caring parents. They make an effort to maintain their relationships with old acquaintances, distant family members, and neighbors.

Phlegmatic individuals are naturally sociable and attract many friends with their dry, subtle sense of humor. They can make others laugh heartily without even cracking a smile themselves. Their talent for finding humor in the everyday actions of others helps them maintain a positive outlook on life. With a sharp, retentive mind, they excel in imitating others and have a remarkable ability to remember details.

The phlegmatic personality type is calm, easygoing, and has a high boiling point. They rarely grow furious and they are the most approachable, appealing personality type and the easiest type of person to get along. By nature, they are the most likeable of all the temperaments. They are very much into charity and helping others. Ideal careers for phlegmatic personality types should be related to; Nursing, Teaching, Psychology or Counseling, Child Development, Social Services[4].

Strengths: supportive, empathetic, and a great listener; often the peacemaker looking out for others; easily contented and happy to be part of the team (not the boss) .

Weaknesses: may struggle to take initiative when necessary, and can avoid conflict and sharing strong feelings [5].

3 ANALYZING YOUR OWN TEMPERAMENT

Your predominant or basic temperament, the one that influences you the most, should not be too difficult to diagnose. Just ask yourself a few questions while looking at the following illustrations[4].

1. Are you an extrovert? If so, you are predominantly sanguine or choleric.
2. If "yes" to 1, ask yourself, "Do I lean toward being a super extrovert?" That is, are you generally the first to speak? If so, you are a sanguine.
3. If "yes" to 1, ask yourself if you are a good salesman type. If so, you are predominantly sanguine.
4. If "yes" to 1, but "no" to 2 and 3, ask, "Am I a 'strong natural leader?'" If so, you are probably a choleric.
5. If you answered "no" to 1—that is, you are not an extrovert—then ask yourself, "Am I a perfectionist, analytical, and somewhat critical?" If so, you are probably predominantly melancholy.

If you answered "no" to 1, ask yourself if you are known by others as "very quiet." Do you rarely get angry but experience many fears and worries? If so, you are probably phlegmatic. This, of course, is an oversimplified test, and it only considers your predominant temperament. However, it will help you even at this point to have a strong indication of which temperament you are (P. 32-33) [4].

4 THE IMPORTANCE OF UNDERSTANDING ONES OWN TEMPERAMENT TO NURSES

Understanding one's own temperament is a crucial aspect for nurses as it forms the foundation for positive and respectful interactions with patients and others. The following are some of the importance:

1. **Self-awareness:** Nurses need to engage in self-reflection to understand their own temperament. This involves recognizing personal strengths, weaknesses, and patterns of behavior. Self-awareness enables nurses to identify potential triggers that may affect their interactions with patients and colleagues.

2. **Self-improvement:** Once you have examined your weaknesses and understand why you act the way you do, you are better able to call upon God for his resources to improve your temperament by strengthening your weaknesses.
3. **Understanding and accepting others:** As long as you live, people will confront you. When you understand why they do what they do, it is easier to accept and love them.
4. **Effective Communication:** Different temperaments may require varied communication styles. Nurses who understand their own temperament can adapt their communication to meet the needs of diverse patients. Clarity, patience, and active listening become essential components of effective communication in healthcare settings.
5. **Conflict Resolution:** Healthcare environments often involve high-stress situations and potential conflicts. Understanding one's temperament helps nurses manage conflicts with patients, families, and colleagues more effectively. By remaining self-aware during tense moments, nurses can respond in a way that promotes resolution rather than escalating the situation.
6. **Building Trust and Rapport:** Patients are more likely to trust and engage with healthcare providers who demonstrate authenticity and consistency. Understanding one's own temperament contributes to a consistent and trustworthy nursing approach. Consistency in temperament creates a stable and predictable environment for patients, fostering a sense of security and trust.
7. **Stress Management:** Nursing can be emotionally demanding. Understanding one's temperament aids in recognizing personal stressors and implementing effective coping strategies. Stress management contributes to a nurse's overall well-being and, by extension, positively impacts the quality of care provided.

5 HOW NURSES CAN RELATE IN A POSITIVE AND RESPECTFUL INTERACTIONS WITH PATIENTS AND OTHERS REGARDLESS OF THEIR TEMPERAMENT

Nurses are the only professionals that stay with the patient's 24 hours clockwise and also, they are the professionals that get connected more to the patient's relatives and other healthcare workers (such as the physician, physiotherapist, pharmacist, nutritionist, radiologist, lab scientist etc.) within the healthcare settings.

Interpersonal relationships between people, including those between nurses and patients as professionals, are one of the main challenges to human coexistence. One of the main causes of many communication breakdowns between people is a lack of interpersonal skills, or the inability to accept people for who they are and relate to them based on their personality traits, our temperament diversities could also be major reasons why humans have become intolerant of one another [6].

Some temperament types are more suited for interpersonal relationships than others are. Certain temperaments are more complimentary and submissive, whereas others are more dominant and egotistical, which may account for their shortcomings. Certain temperaments require consistency in their traits and lifestyles in order to establish and sustain a friendly relationship. This inconsistency no doubt often hinders them from having a peaceful and long lasting interpersonal relationship [6].

However, for the nurse to relate perfectly with anyone regardless of their temperament, the followings steps should be followed:

Step 1: Understand your own temperament- this serve as the bedrock and foundation for a cordial relationship. With this, you will be able to discover your potentials and identify your weaknesses so that you will be able to work over it in order to improve your relationship pattern

Step 2: Discover other peoples temperament- the nurse must understand and know the temperament of everyone she relate with, which clearly control and Influences the way they do things. Having a very clear understanding of everyone's temperament will enable nurse to know the inherent strengths and weaknesses that are embedded in such temperament, and how best to relate with the patients and others within the healthcare settings.

Step 3: Apply the Coulomb's law- The law states that like charges repel while unlike charges attract. This implies that people with similar primary temperament do not attract each other and will not be at peace with each other when they stay together for long. On the other hand, people with a dissimilar temperament find themselves attractive to each other and have it simple to overcome each other weaknesses. Therefore, the nurse should react to her patients and others based on their various inherent temperament.

The sociologist often said melancholy have a mutual relationship with the sanguine better than to other temperament types. Moreover, the choleric get attracted more to the phlegmatic. Nevertheless, if the nurse want to build a better relationship with others, she must kill self-love, and realize that her patients/clients has weaknesses the same way she do.

6 CONCLUSION

In conclusion, nurses are expected to be good human managers with excellent human relations with their patients and others within healthcare settings, regardless of their inherited temperament categories. Therefore, consciously integrating the comprehension of one's own temperament and understanding why people act and behave the way they do into nursing practice will provide a foundation aimed not only at enhancing the quality of care but also at fostering healthier relationships between nurses and patients.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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FROM TENSION TO COOPERATION: THE FACTORS BEHINDS PAKISTAN RUSSIA EMERGENT RELATIONS

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Abstract: The evolution of international relations often involves a journey from historical tensions to cooperative partnerships, exemplifying the potential for nations to transcend challenges and build constructive alliances. This research paper delves into the transformation of the Pakistan-Russia relationship, examining the factors that have driven this shift from a history of tension to one of cooperation. It explores the intricate interplay of historical legacies, regional security dynamics, changing global power structures, and proactive diplomatic initiatives that have paved the way for a more collaborative partnership. The historical backdrop of the Cold War era cast a long shadow on the Pakistan-Russia relationship, characterized by ideological differences and alignment with opposing superpowers. However, the tides of time and shifting global dynamics prompted both nations to reassess their positions, setting the stage for new avenues of cooperation. The shared concerns over terrorism and extremism acted as catalysts for joint counterterrorism efforts, intelligence sharing, and enhanced security cooperation. These efforts, born from mutual interests in countering global threats, laid the foundation for building trust and mutual understanding. Economic and trade relations emerged as another critical dimension in the transformation. Collaborative energy ventures, trade agreements, and infrastructure projects have not only expanded economic ties but also contributed to energy security and connectivity. The mutual recognition of shared interests in regional stability led to both nations participating actively in multilateral forums, including the Shanghai Cooperation Organization (SCO), and engaging in diplomatic outreach beyond bilateral exchanges. While the path to cooperation is promising, challenges persist. Lingering historical tensions, regional dynamics, and external influences continue to cast shadows on the partnership. Addressing these challenges requires diplomatic finesse and pragmatic engagement that prioritizes mutual interests over historical grievances. The transformation of the Pakistan-Russia relationship carries implications that extend beyond bilateral ties. It serves as a testament to the power of cultural diplomacy, people-to-people exchanges, and the willingness to adapt to changing global power structures. The collaborative efforts of Pakistan and Russia in countering global challenges set a precedent for constructive partnerships in a multipolar world. In conclusion, the transformation of the Pakistan-Russia relationship is a narrative of resilience, pragmatism, and shared interests. By analyzing the multifaceted factors behind this evolution, assessing its impact on various dimensions of cooperation, and reflecting on its implications for international relations, this research paper provides insights into how nations can navigate historical complexities to forge meaningful and productive partnerships in pursuit of shared prosperity and stability.

Keywords: Cold War; SCO; Cultural diplomacy; Pragmatism

1 INTRODUCTION

1.1 Background and Significance of the Pakistan-Russia Relationship

The relationship between Pakistan and Russia has traversed a complex trajectory, marked by periods of tension and cooperation. Historically, during the Cold War, the two nations found themselves on opposite sides of the ideological and geopolitical divide, with Pakistan aligned closely with the United States and Russia with the Soviet Union. This resulted in a strained relationship that persisted well into the post-Cold War era. However, recent years have witnessed a notable shift in the dynamics, as Pakistan and Russia have moved from suspicion to collaborative efforts across various domains[1].

The significance of understanding this transformation lies not only in its own right but also in its broader implications for regional stability and global geopolitics. As the world witnesses changing power dynamics, particularly in South Asia and Eurasia, the Pakistan-Russia relationship serves as an intriguing case study of how historical tensions can be overcome to forge mutually beneficial cooperation. Moreover, the partnership between Pakistan and Russia holds potential to reshape regional security, economic integration, and counterterrorism efforts, rendering it a topic of great scholarly and policy interest[2].

1.2 Research Objective and Scope

The primary objective of this research paper is to dissect and analyze the factors that have contributed to the transformation of the Pakistan-Russia relationship from a history of tension to the current era of cooperation. By undertaking an in-depth examination of the elements that have driven this shift, the paper aims to shed light on the intricate mechanisms and dynamics involved in altering bilateral relations. The analysis will not only provide insights into the evolution of the Pakistan-Russia relationship itself but will also offer broader lessons for understanding diplomatic transformations in international relations[3].

1.3 Methodology and Approach

The methodology employed for this research paper involves a multi-faceted approach. A comprehensive literature review has been conducted to delve into the historical background of the relationship, as well as to extract key insights from academic works, official documents, policy statements, and reputable news sources. Furthermore, qualitative analysis of diplomatic engagements, economic collaborations, and security cooperation initiatives has been undertaken to identify patterns and trends. Interviews with experts and stakeholders in the field have also provided valuable perspectives on the evolving relationship[4].

1.4 Structure of the Research Paper

This research paper is structured to provide a comprehensive understanding of the transformation of the Pakistan-Russia relationship. Following this introduction, the subsequent sections will delve into specific factors that have played a role in this transformation. These factors include geostrategic considerations, diplomatic efforts, economic ties, security cooperation, multilateral engagements, energy and infrastructure projects, shifting global alliances, and cultural exchanges. Each section will analyze the impact of these factors on the relationship's evolution, using evidence and examples to substantiate the analysis[5].

1.5 Anticipated Contribution and Implications

By examining the journey of the Pakistan-Russia relationship from tension to cooperation, this research paper aims to contribute to the academic discourse on international relations, diplomacy, and the dynamics of transforming bilateral ties. The insights gained from this study could potentially guide policymakers in understanding how to navigate and nurture diplomatic partnerships in contexts marked by historical conflicts. Moreover, the findings of this research may also inform international relations theories by providing a real-world case study of the various factors that influence the evolution of diplomatic relationships[6].

2 HISTORICAL OVERVIEW OF PAKISTAN-RUSSIA RELATIONS

The history of Pakistan-Russia relations is marked by a complex interplay of geopolitical factors, ideological alignments, and changing global dynamics. This historical overview provides insights into the evolution of their relationship, from its early stages to the contemporary era of emerging cooperation[1].

2.1 Early Relations and Cold War Dynamics

During the early years of Pakistan's existence, following its independence in 1947, the global geopolitical landscape was dominated by the Cold War rivalry between the United States and the Soviet Union. Pakistan's strategic location in the heart of South Asia attracted the attention of both superpowers, each vying to secure allies in the region. Pakistan's close alignment with the United States in the formative years of its existence set the tone for its international alliances. Conversely, the Soviet Union maintained close relations with India, Pakistan's arch-rival, which further strained the prospects of a positive Pakistan-Russia relationship. This early polarization set the stage for decades of strained interactions and limited diplomatic engagement between Pakistan and Russia[2].

2.2 The Era of Distrust and Tensions

The height of the Cold War saw Pakistan firmly aligned with the Western bloc, particularly the United States. The Soviet invasion of Afghanistan in 1979 and the subsequent U.S.-backed resistance further deepened the rift between Pakistan and Russia. Pakistan's role as a conduit for supporting Afghan insurgents led to a hostile response from Moscow, creating an atmosphere of deep distrust.

The global power struggle also influenced the bilateral dynamics. While Pakistan sought security assurances from its Western allies, Russia viewed Pakistan's partnership with the U.S. as a threat to regional stability. This period of heightened tension left little room for diplomatic cooperation and set a precedent for decades of diplomatic estrangement[6].

2.3 Initial Steps toward Cooperation

The turn of the 21st century marked a significant shift in the geopolitical landscape. With the end of the Cold War and the emergence of new global challenges, both Pakistan and Russia recognized the need for a more pragmatic approach. The late 1990s and early 2000s witnessed initial attempts at rapprochement, as both nations explored possibilities for cooperation beyond their historical baggage. Bilateral visits and diplomatic exchanges gradually helped ease some of the lingering mistrust. Pakistan's pursuit of a balanced foreign policy, coupled with Russia's reevaluation of its regional strategy, provided the impetus for renewed engagement. This era also saw the recognition of shared challenges, such as combating terrorism and promoting regional stability, which provided common ground for dialogue.

In conclusion, the historical overview of Pakistan-Russia relations illustrates the intricate interplay of global power dynamics, regional rivalries, and changing priorities that have shaped the course of their relationship. From the early alignments of the Cold War to the more recent efforts at cooperation, this overview serves as a foundation for understanding the complexities underlying their evolving partnership[7].

3 GEOSTRATEGIC CONSIDERATIONS

The transformation of the Pakistan-Russia relationship from tension to cooperation is deeply rooted in changing regional and global geopolitical dynamics. This section explores the pivotal role of these geostrategic considerations in shaping the evolving partnership between the two nations[8].

3.1 Changing Regional and Global Geopolitics

The post-Cold War era witnessed a significant realignment of global power dynamics. The waning influence of bipolar superpower rivalry and the emergence of new centers of economic and political power prompted nations like Pakistan and Russia to reassess their geopolitical orientations. The gradual shift from a unipolar to a multipolar world order prompted both nations to seek diverse alliances and partnerships to safeguard their national interests.

As the United States' role evolved and China's influence expanded, both Pakistan and Russia found themselves navigating a complex web of strategic relationships. This shifting landscape prompted a reevaluation of their own regional strategies, opening avenues for reengagement and collaboration[9].

3.2 Shared Interests and Security Concerns

The convergence of shared interests and security concerns has played a pivotal role in reshaping the Pakistan-Russia relationship. Both nations recognized the mutual benefits of cooperating in areas such as counterterrorism, regional stability, and economic development. The threat of terrorism and extremism, which directly impacts both nations, underscored the need for joint efforts in addressing these challenges[9].

In the face of global challenges like transnational terrorism and organized crime, both Pakistan and Russia recognized the futility of isolation and the imperative of cooperation. This shared realization laid the foundation for a more pragmatic and collaborative approach, leading to joint endeavors to counter common threats[3].

3.3 Role of Afghanistan and Central Asia in the Relationship

Afghanistan and Central Asia have emerged as pivotal factors in the Pakistan-Russia relationship. The instability in Afghanistan, coupled with the complex dynamics of the region, has led both nations to recognize the importance of coordinated efforts for stability and development. Russia's historical involvement in Afghanistan and Pakistan's immediate proximity to the country have influenced their strategic calculations.

The emergence of Central Asia as a critical corridor for energy resources and trade routes has prompted Pakistan and Russia to explore collaborative ventures in energy and infrastructure projects. The development of the China-Pakistan Economic Corridor (CPEC) and Russia's engagement with Central Asian countries has opened new avenues for connectivity and economic cooperation.

In conclusion, the geostrategic considerations that have influenced the Pakistan-Russia relationship transformation are emblematic of the evolving nature of international relations. Changing global and regional dynamics, shared security concerns, and the significance of Afghanistan and Central Asia have converged to shape a more cooperative and nuanced partnership between these two nations[6].

4 DIPLOMATIC OUTREACH AND CONFIDENCE-BUILDING

The transition of the Pakistan-Russia relationship from a history of tension to one of cooperation has been facilitated by diplomatic overtures and confidence-building measures. This section delves into the key diplomatic engagements, bilateral visits, and various strategies that have fostered trust and understanding between the two nations.

4.1 Key Diplomatic Engagements and Milestones

In recent years, both Pakistan and Russia have made significant strides in forging a path of diplomatic engagement. Notable milestones include the resumption of high-level official visits and the establishment of diplomatic mechanisms aimed at enhancing communication and cooperation. These engagements mark a departure from the era of minimal interaction and demonstrate a shared commitment to cultivating a more constructive relationship.

From ministerial visits to exchanges between heads of state, these diplomatic engagements have played a crucial role in setting the tone for increased collaboration across various domains. The significance of these encounters lies not only in the symbolism they carry but also in the substantive discussions and agreements that often result from them[10].

4.2 Bilateral Visits and Summits

Bilateral visits and summits between leaders of Pakistan and Russia have acted as pivotal moments in the evolution of their relationship. These high-level interactions provide a platform for discussing mutual concerns, exploring avenues for cooperation, and signaling a commitment to deeper engagement. Such visits have allowed leaders to engage in candid dialogues, addressing historical suspicions and conveying a willingness to move beyond the constraints of the past. The personal rapport established during these encounters has proven instrumental in building a foundation of trust and understanding, laying the groundwork for collaborative initiatives[11].

4.3 Confidence-Building Measures and Track-II Diplomacy

Recognizing the importance of building confidence and trust, both nations have embraced various measures to foster people-to-people interactions and facilitate candid exchanges. Track-II diplomacy, involving unofficial channels and non-governmental actors, has contributed to creating an environment conducive to open discussions on sensitive issues. These confidence-building measures include academic exchanges, cultural interactions, and forums that bring together experts and stakeholders from both nations. These mechanisms provide opportunities to address concerns, clarify misconceptions, and explore potential areas of collaboration away from the glare of official negotiations.

In conclusion, the diplomatic outreach and confidence-building strategies employed by Pakistan and Russia have been instrumental in turning the tide of suspicion toward a more cooperative relationship. Through key diplomatic engagements, bilateral visits, and creative Track-II diplomacy, both nations have worked to break down barriers, build mutual trust, and lay the groundwork for a more robust partnership[12].

5 ECONOMIC AND TRADE RELATIONS

The evolution of the Pakistan-Russia relationship from tension to cooperation has been mirrored in their economic and trade ties. This section delves into the significant developments in trade agreements, energy cooperation, infrastructure projects, and the challenges that have both constrained and propelled their economic collaboration.

5.1 Trade Agreements and Economic Cooperation Initiatives

The expansion of economic and trade relations between Pakistan and Russia have been marked by a series of bilateral agreements and initiatives. Trade agreements, such as Preferential Trade Agreements (PTAs) and Memoranda of Understanding (MoUs), have facilitated the exchange of goods and services between the two nations.

Initiatives aimed at enhancing economic cooperation have encompassed a wide range of sectors, including agriculture, textiles, and pharmaceuticals. These endeavors signify a shift from historical barriers to mutually beneficial collaboration, with both nations recognizing the potential for economic growth through joint ventures[13].

5.2 Energy and Infrastructure Projects

Energy cooperation has emerged as a cornerstone of the evolving Pakistan-Russia relationship. Collaborative efforts in the energy sector, including agreements on liquefied natural gas (LNG) and exploration of oil and gas reserves, have paved the way for energy security and diversification of energy sources for Pakistan.

Furthermore, joint infrastructure projects have contributed to enhancing connectivity and regional integration. Notable examples include the North-South Gas Pipeline and potential collaborations within the framework of the China-Pakistan Economic Corridor (CPEC). These projects not only boost economic ties but also contribute to regional stability and connectivity[14].

5.3 Opportunities and Challenges in Expanding Economic Ties

While the economic cooperation between Pakistan and Russia has shown promising growth, it also faces its share of challenges. Factors such as bureaucratic hurdles, regulatory barriers, and logistical issues have at times hindered the smooth progression of economic relations. Differences in economic structures and market demands necessitate careful negotiation to maximize the benefits of collaboration.

Moreover, geopolitical factors and global economic trends can impact the trajectory of economic ties. External influences, including the relations of each country with other major players, can shape the extent and nature of their economic engagement. Balancing these factors requires a nuanced approach that takes into account the unique strengths and limitations of each nation.

In conclusion, the economic and trade relations between Pakistan and Russia provide a tangible reflection of their evolving partnership. From trade agreements and energy projects to infrastructure initiatives, their collaboration underscores the potential for shared growth and development. Navigating challenges and seizing opportunities will be integral to further expanding and strengthening their economic ties[15].

6 COUNTERTERRORISM AND SECURITY COOPERATION

Counterterrorism and security cooperation have emerged as critical areas of collaboration in the transformation of the Pakistan-Russia relationship. This section delves into the shared concerns over terrorism and extremism, intelligence sharing, joint counterterrorism efforts, and the role of military exercises and training programs in enhancing security ties.

6.1 Mutual Concerns over Terrorism and Extremism

Both Pakistan and Russia have faced significant challenges posed by terrorism and extremism within their respective territories. The threat of transnational terrorism, as well as the potential for its spread, has prompted both nations to recognize the importance of collective action in countering these threats. The convergence of these concerns has laid the foundation for a common security agenda.

The recognition of the destabilizing effects of terrorism and extremism has provided impetus for collaboration in addressing the root causes, preventing radicalization, and thwarting the activities of terrorist groups. This shared challenge has created a platform for enhanced security cooperation[16].

6.2 Intelligence Sharing and Joint Counterterrorism Efforts

Effective counterterrorism efforts hinge on robust intelligence sharing and joint action. Pakistan and Russia have worked to establish mechanisms for the exchange of crucial intelligence related to potential threats. The pooling of resources, information, and expertise has enabled more proactive responses to emerging security challenges.

Joint counterterrorism efforts have involved coordinated operations against terrorist networks, as well as the sharing of best practices and strategies. The establishment of communication channels and the alignment of security objectives have facilitated rapid response capabilities, reducing vulnerabilities and enhancing the effectiveness of counterterrorism measures.

6.3 Military Exercises and Training Programs

Mutual security concerns have led to increased military-to-military interactions between Pakistan and Russia. Joint military exercises and training programs serve as avenues for enhancing interoperability, sharing tactical knowledge, and improving the readiness of their armed forces. These exercises not only bolster the capabilities of both nations but also foster a deeper understanding of each other's security environments. The exchange of military delegations, high-level visits, and participation in regional security forums contribute to building trust and confidence between the defense establishments. Such engagements promote transparency and demonstrate a shared commitment to regional stability.

In conclusion, counterterrorism and security cooperation represent a pivotal area of the evolving Pakistan-Russia relationship. The alignment of interests in combating terrorism and extremism has led to intelligence sharing, coordinated counterterrorism efforts, and joint military exercises. By addressing shared security challenges, both nations are working to create a safer and more stable environment in the region[17].

7 MULTILATERAL ENGAGEMENTS

The transformation of the Pakistan-Russia relationship from tension to cooperation is not confined to bilateral interactions alone. Multilateral engagements play a crucial role in shaping their evolving partnership. This section explores the participation of both nations in regional and international organizations, their roles within the Shanghai Cooperation Organization (SCO), and their collaboration in counterterrorism initiatives.

7.1 Participation in Regional and International Organizations

Both Pakistan and Russia recognize the importance of multilateralism in addressing global challenges. Their engagement in various regional and international organizations underscores their commitment to fostering stability, security, and cooperation beyond their immediate bilateral ties. Participation in forums such as the United Nations, Organization of Islamic Cooperation (OIC), and the Commonwealth of Independent States (CIS) reflects their shared objectives on a broader stage.

Participation in these organizations provides opportunities for diplomatic dialogue, joint initiatives, and the projection of shared interests on a global platform. This participation also signals their willingness to play constructive roles in addressing pressing regional and global issues[18].

7.2 Role within the Shanghai Cooperation Organization (SCO)

The Shanghai Cooperation Organization (SCO) stands out as a significant platform for Pakistan and Russia to engage in multilateral cooperation. Both nations are full members of the SCO, an intergovernmental organization that focuses on security, economic cooperation, and cultural exchange in the Eurasian region. Their participation within the SCO reflects their shared interests in regional stability and counterterrorism efforts.

The SCO serves as a mechanism to strengthen ties, align strategies, and pool resources in addressing common challenges. Through the SCO, Pakistan and Russia engage in discussions and initiatives that contribute to regional security, economic development, and cultural exchange[19].

7.3 Collaboration in Counterterrorism Initiatives

Counterterrorism cooperation extends beyond bilateral efforts, encompassing multilateral initiatives. Both Pakistan and Russia recognize the importance of collective action to combat the global threat of terrorism. Their collaborative endeavors within organizations like the SCO and the Collective Security Treaty Organization (CSTO) exemplify their shared commitment to counterterrorism efforts.

Participation in counterterrorism initiatives involves sharing experiences, best practices, and intelligence among member states. This collaboration not only enhances their own security capabilities but also contributes to regional stability by addressing the root causes of extremism and terrorism.

In conclusion, multilateral engagements have played a pivotal role in shaping the transformation of the Pakistan-Russia relationship. Participation in regional and international organizations, roles within the SCO, and collaboration in counterterrorism initiatives highlight their commitment to broader cooperation, contributing to regional stability and security[19].

8 ENERGY AND INFRASTRUCTURE PROJECTS

Energy and infrastructure projects have emerged as critical pillars of cooperation in the transformation of the Pakistan-Russia relationship. This section delves into the joint energy ventures, energy security cooperation, transportation and connectivity projects, and the broader impacts of these initiatives on economic and strategic collaboration.

8.1 Joint Energy Ventures and Energy Security Cooperation

The collaboration between Pakistan and Russia in the energy sector has the potential to redefine their economic relationship. Joint energy ventures, such as agreements on liquefied natural gas (LNG) and exploration of oil and gas reserves, contribute to energy security and diversification for Pakistan. These ventures reduce the nation's reliance on a single source of energy and mitigate the risks associated with supply disruptions.

Furthermore, energy security cooperation bolsters the resilience of both nations' energy sectors. The sharing of expertise, technology, and best practices in energy production, distribution, and storage enhances the stability of energy supplies, contributing to economic growth and development[19].

8.2 Transportation and Connectivity Projects

Transportation and connectivity projects play a pivotal role in fostering economic integration and regional connectivity. Collaborative efforts within the framework of the China-Pakistan Economic Corridor (CPEC) and other initiatives contribute to improved trade routes, efficient logistics, and enhanced people-to-people exchanges.

Projects like the North-South Gas Pipeline and the development of transportation corridors have the potential to bridge geographical divides, promoting trade and investment opportunities. These initiatives not only facilitate economic interactions but also contribute to social and cultural exchanges, further strengthening the overall relationship.

8.3 Impacts on Economic and Strategic Cooperation

The synergy between energy and infrastructure projects extends beyond their immediate economic benefits. The establishment of joint ventures and connectivity initiatives fosters a more comprehensive economic partnership, creating opportunities for trade, investment, and technology transfer. These projects act as catalysts for economic growth in both nations, propelling them toward shared prosperity.

Strategically, energy security and infrastructure connectivity contribute to regional stability and reduce vulnerabilities. The reliable supply of energy resources and the improved efficiency of transportation networks strengthen the resilience of both nations' economies, enhancing their ability to withstand external shocks.

In conclusion, energy and infrastructure projects represent transformative elements in the Pakistan-Russia relationship. Joint energy ventures and transportation initiatives not only bolster economic ties but also contribute to energy security, connectivity, and strategic collaboration. By working together in these areas, both nations pave the way for sustained economic growth and regional stability[12].

9 CHANGING GLOBAL ALLIANCES AND BALANCING ACTS

The transformation of the Pakistan-Russia relationship is intertwined with the changing landscape of global alliances and the intricate balance of interests among major powers. This section explores the evolving global power dynamics, the impact of the United States and China on the relationship, and the challenges and considerations associated with balancing regional alliances and interests.

9.1 Evolving Global Power Dynamics

The post-Cold War era has witnessed a reshuffling of global power dynamics, with emerging powers seeking to assert their influence on the international stage. This shift has prompted nations to reassess their allegiances and alignments in pursuit of their national interests. For both Pakistan and Russia, these evolving dynamics have necessitated a recalibration of their foreign policy priorities and engagement strategies.

The diversification of partnerships beyond traditional alliances is a hallmark of this evolution. Both nations have recognized the need to cultivate relationships with a variety of global players to safeguard their interests in a multipolar world.

9.2 Impact of the United States and China on the Relationship

The influence of major powers like the United States and China has had a notable impact on the Pakistan-Russia relationship. Historically, Pakistan's close alignment with the United States and Russia's association with the Soviet Union contributed to the tension between the two nations. However, with the changing dynamics, both Pakistan and Russia have sought to engage with a broader spectrum of nations.

The burgeoning economic and strategic partnership between China and Pakistan, particularly through projects like the China-Pakistan Economic Corridor (CPEC), has created opportunities for Russia to engage more actively in the region. The mutual interests shared with China and Russia have fostered a strategic environment conducive to cooperation[20].

9.3 Balancing Regional Alliances and Interests

Balancing regional alliances and interests presents a challenge for both Pakistan and Russia. The historical alignments and rivalries of both nations continue to influence their relationships in the broader region. For Pakistan, maintaining its engagement with regional players like the United States and Saudi Arabia while deepening its ties with Russia requires a delicate balancing act.

Similarly, Russia's regional interests and alliances in Central Asia and the Middle East necessitate strategic considerations when engaging with Pakistan. Both nations must navigate their commitments to other regional partners while pursuing their shared objectives for cooperation and stability.

In conclusion, the changing global alliances and the balancing of interests have played a significant role in shaping the transformation of the Pakistan-Russia relationship. The evolving dynamics of major powers like the United States and China, as well as the careful calibration of regional alliances, highlight the complex strategic calculations that underpin the evolving partnership between these two nations[21].

10 CULTURAL AND PEOPLE-TO-PEOPLE EXCHANGES

Cultural and people-to-people exchanges have emerged as soft power tools in fostering the transformation of the Pakistan-Russia relationship. This section delves into the role of cultural diplomacy, educational and academic collaborations, and the significance of these exchanges in fostering understanding and building trust between the two nations.

10.1 Cultural Diplomacy and Exchanges

Cultural diplomacy serves as a bridge between nations, facilitating the exchange of ideas, values, and traditions. Both Pakistan and Russia recognize the potential of cultural exchanges to transcend political differences and promote mutual understanding. Cultural events, artistic performances, and exhibitions showcase the richness of each nation's heritage and create avenues for dialogue beyond official diplomatic channels.

By engaging in cultural exchanges, both nations not only celebrate their respective cultures but also demonstrate their openness to dialogue and cooperation. Cultural diplomacy enhances the public perception of nations, fostering goodwill and contributing to the gradual erosion of historical misconceptions[22].

10.2 Educational and Academic Collaborations

Educational and academic collaborations play a crucial role in enhancing mutual understanding and building lasting connections. Student exchanges, joint research projects, and academic partnerships provide opportunities for young minds from both nations to interact, learn from each other, and develop a nuanced perspective of the other's society.

These collaborations also contribute to capacity building and knowledge sharing. The exchange of expertise and the pursuit of shared research interests contribute to the development of human resources and the advancement of scientific and academic endeavors in both Pakistan and Russia.

10.3 Role in Fostering Understanding and Building Trust

Cultural and people-to-people exchanges foster a sense of familiarity and empathy that goes beyond official diplomacy. By experiencing the cultural, social, and intellectual aspects of each other's societies, people develop a deeper appreciation for the similarities and differences that shape their identities. This understanding is pivotal in dispelling stereotypes and building a foundation of trust.

These exchanges contribute to the creation of a reservoir of goodwill that can positively impact diplomatic relations during times of tension. People who have participated in such exchanges often become advocates for stronger bilateral relations, thus creating a multiplier effect that extends the reach of cultural diplomacy.

In conclusion, cultural and people-to-people exchanges represent a powerful tool in transforming the Pakistan-Russia relationship. Through cultural diplomacy, educational collaborations, and building human connections, both nations are creating avenues for mutual understanding and trust. These exchanges contribute to a more comprehensive and resilient partnership that transcends the confines of official diplomacy[23].

11 CHALLENGES AND HURDLES

While the transformation of the Pakistan-Russia relationship from tension to cooperation is a significant development, it is not without its challenges and hurdles. This section examines the lingering historical tensions and mistrust, regional and domestic factors affecting cooperation, and the impact of external influences and competition on the relationship.

11.1 Lingering Historical Tensions and Mistrust

The weight of historical tensions and mistrust from the Cold War era continues to cast a shadow over the Pakistan-Russia relationship. The legacy of ideological differences, alignment with opposing superpowers, and previous conflicts has left a residue of skepticism that hinders the path to full cooperation. Deep-seated historical perceptions can occasionally resurface, impacting the pace and scope of diplomatic initiatives.

Addressing these historical tensions requires patience, understanding, and proactive measures to counter misinformation and misconceptions. Diplomatic efforts must be focused on building new narratives that acknowledge the past while emphasizing shared interests and the potential for a mutually beneficial partnership[24].

11.2 Regional and Domestic Factors Affecting Cooperation

Domestic and regional factors can complicate efforts to deepen cooperation between Pakistan and Russia. The political, economic, and security dynamics within each nation can influence their engagement with each other. The presence of other regional players, historical rivalries, and the complexity of existing alliances may necessitate careful maneuvering to ensure that bilateral cooperation is not hampered.

Additionally, domestic priorities such as economic development, social welfare, and governance may divert attention and resources away from foreign policy objectives. Balancing internal demands with external commitments is a challenge that both nations must navigate[25].

11.3 External Influences and Competition

External influences, particularly from major powers with global and regional interests, can impact the trajectory of the Pakistan-Russia relationship. The interests and actions of countries like the United States, China, and India can either enable or constrain the depth of cooperation between Pakistan and Russia. Competition for influence and access to resources in the region can introduce complexities that require careful diplomacy to navigate. Balancing relationships with various external actors while advancing the Pakistan-Russia partnership necessitates astute diplomacy and strategic foresight. Navigating through the multipolar world requires both nations to exercise agency while managing the sensitivities of external stakeholders.

In conclusion, the journey from tension to cooperation in the Pakistan-Russia relationship is accompanied by challenges and hurdles that stem from historical baggage, regional dynamics, and external influences. Addressing these challenges demands a combination of diplomatic finesse, proactive engagement, and a commitment to mutual interests. By acknowledging and overcoming these obstacles, both nations can solidify their transformation into a meaningful and productive partnership[26].

12 FUTURE PROSPECTS AND OPPORTUNITIES

As the Pakistan-Russia relationship continues to evolve from tension to cooperation, the future holds promising prospects for further collaboration. This section explores the potential areas for deeper cooperation, the role of this partnership in regional stability and security, and the implications of this transformation for both South Asian and Eurasian dynamics.

12.1 Potential Areas for Further Cooperation

The transformation of the Pakistan-Russia relationship opens doors to a multitude of potential areas for further cooperation. Beyond the existing domains of counterterrorism, energy, and cultural exchanges, opportunities lie in sectors such as science and technology, healthcare, agriculture, and space exploration. Joint ventures in these areas can yield mutual benefits and contribute to the socio-economic development of both nations.

Moreover, strategic dialogues on global issues such as climate change, non-proliferation, and cyber security present avenues for collaboration that can enhance their standing on the international stage. The diversification of collaboration across a broader spectrum of domains demonstrates the depth of their partnership and their commitment to shared progress[27].

12.2 Role in Regional Stability and Security

The strengthened Pakistan-Russia relationship has the potential to play a constructive role in enhancing regional stability and security. By leveraging their respective influence and partnerships, both nations can contribute to conflict resolution, peace-building efforts, and crisis management in South Asia and beyond.

Their collective efforts in countering terrorism, promoting diplomatic dialogue, and supporting regional organizations can have far-reaching positive impacts. A stable and secure environment would not only benefit the immediate region but also create an atmosphere conducive to sustained economic growth and development[28].

12.3 Implications for South Asian and Eurasian Dynamics

The transformation of the Pakistan-Russia relationship has implications for the broader dynamics of both the South Asian and Eurasian regions. In South Asia, the emerging partnership contributes to the diversification of diplomatic alignments, challenging historical patterns of rivalry. It introduces a new dimension of cooperation that can potentially contribute to conflict resolution and regional integration.

In the context of Eurasia, the Pakistan-Russia relationship adds to the complexity of alliances and interactions. As both nations engage in various multilateral forums, including the SCO, they contribute to shaping the dynamics of a region that is home to diverse interests, players, and challenges. Their collaboration sets a precedent for pragmatic engagement that takes into account historical realities and the changing global order[17].

In conclusion, the future prospects and opportunities in the Pakistan-Russia relationship are promising and multifaceted. As both nations continue to build on their cooperation, they have the potential to contribute to regional stability, address shared challenges, and play pivotal roles in shaping the contours of South Asian and Eurasian dynamics[28].

13 CONCLUSION

The transformation of the Pakistan-Russia relationship from a history of tension to one of cooperation has been a remarkable journey marked by multifaceted factors and evolving dynamics. This section summarizes the key factors that have driven this transformation, analyzes the overall impact of the changing relationship, and offers reflections on the broader significance for international relations.

13.1 Summarizing the Factors behind the Transformation

The journey of the Pakistan-Russia relationship from tension to cooperation is a reflection of the convergence of various factors. Historical tensions, regional security challenges, and shifting global power dynamics have all played pivotal roles in shaping the course of their engagement. Diplomatic outreach, economic collaboration, counterterrorism efforts, and cultural exchanges have acted as catalysts in bridging gaps and building mutual trust.

The interplay of these factors has led to a comprehensive transformation that underscores the potential for nations to transcend historical enmities and forge constructive partnerships in pursuit of shared objectives[24].

13.2 Analyzing the Overall Impact of the Transformation

The transformation of the Pakistan-Russia relationship holds significant implications for both nations and the broader region. Economically, the expansion of trade and joint ventures promises growth and development opportunities. Strategically, their collaborative efforts in counterterrorism and security cooperation contribute to regional stability and peace.

The transformation also presents a model for conflict resolution and diplomatic engagement in a world fraught with challenges. The willingness of Pakistan and Russia to set aside historical suspicions in favor of collaboration serves as an example of pragmatic diplomacy that prioritizes mutual interests over ideological differences.[24]

13.3 Reflections on the Significance for International Relations

The transformation of the Pakistan-Russia relationship offers valuable insights into the evolving nature of international relations. It exemplifies how nations can adapt to changing global dynamics, forge partnerships based on mutual interests, and overcome historical constraints. The case of Pakistan and Russia highlights the potential for diplomatic engagement to yield positive outcomes that ripple beyond bilateral relations.

Furthermore, the transformation reinforces the importance of multilateralism, cultural diplomacy, and people-to-people exchanges in nurturing lasting partnerships. The ability to navigate complex geopolitical landscapes while pursuing shared objectives showcases the potential for nations to contribute positively to regional and global stability.

In conclusion, the transformation of the Pakistan-Russia relationship serves as a testament to the power of diplomacy, cooperation, and the pursuit of mutual interests. By examining the factors behind this transformation, analyzing its impact, and reflecting on its significance for international relations, we gain a deeper understanding of how nations can overcome historical challenges to forge a more prosperous and harmonious world[27].

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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ENTANGLED FEMININITIES: THE COMPLEXITIES OF FEMALE BONDING IN MARGARET ATWOOD'S *THE BLIND ASSASSIN*

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Abstract: This paper examines the intricate dynamics of female relationships in Margaret Atwood's *The Blind Assassin* (2000). Atwood presents a sophisticated portrayal of female bonding that surpasses conventional narratives of sisterhood and friendship, highlighting the complex interplay of intimacy, rivalry, and betrayal. The novel's multi-layered structure integrates a fictional memoir, a science fiction narrative, and a contemporary storyline. It also mirrors the multifaceted nature of the female connections it depicts. This paper investigates how Atwood subverts traditional notions of solidarity by conducting a detailed analysis of the relationships between Iris and Laura Chase, as well as the broader female characters in their social environment. By exposing the underlying tensions and contradictions within these relationships, Atwood reveals the complexities of female bonds that are not easily reconciled with simplistic ideals of unity or support. The paper situates these relationships within the novel's broader social, historical, and patriarchal contexts, demonstrating how Atwood redefines the possibilities and limitations of female intimacy and alliance. This critical exploration offers insights into how Atwood's narrative challenges prevailing assumptions about women's agency and identity, providing a reflective commentary on the constraints imposed by a patriarchal society and the ways in which female characters navigate these constraints.

Keywords: Sisterhood; Obligations; Expectation; Trauma; Conflict; Oppression

1 INTRODUCTION

Margaret Atwood's *The Blind Assassin* is a sophisticated narrative that scrutinises conventional representations of female relationships through its innovative structure and thematic depth. Atwood's portrayal of female bonding is notably nuanced, transcending traditional narratives of sisterhood and friendship by emphasising the intricate interplay of intimacy, rivalry, and betrayal. The novel employs a multi-layered narrative structure, integrating a fictional memoir, a science fiction story, and a contemporary plot, thereby reflecting the complexities inherent in the female connections it portrays. Central to this exploration are the relationships between Iris Chase and her sister Laura, which serve as a focal point for understanding broader themes of affection and conflict. The novel's structure mirrors the intricate nature of these relationships, presenting them as multifaceted rather than idealized. Through this approach, Atwood subverts conventional idealisations of female solidarity, instead highlighting the contradictions and tensions that characterise such bonds.

The interplay between intimacy and rivalry is a prominent theme in *The Blind Assassin*. The relationship between Iris and Laura is marked by both deep affection and significant strain, encapsulating the duality inherent in sibling connections. Their interactions reflect a broader commentary on female alliances, where support and enmity coexist. Atwood's portrayal challenges simplistic notions of sisterhood and friendship, suggesting that female bonds are shaped by various influences, including personal ambitions, societal expectations, and familial obligations. Moreover, Atwood situates these relationships within a broader socio-historical and patriarchal context, illustrating how external pressures and gender norms impact the nature of female bonding. The novel critiques the limitations imposed by a patriarchal society, demonstrating how these constraints affect women's capacity to form and sustain authentic connections. Atwood's exploration offers a critical reflection on how societal structures shape and often undermine female relationships.

The narrative structure of *The Blind Assassin* itself is integral to reflecting the complexities of female bonding. By interweaving multiple narrative layers, Atwood creates a rich tapestry that allows for a nuanced exploration of her characters' relationships. The fictional memoir and science fiction story embedded within the novel provide alternative perspectives on the central themes, adding depth to the portrayal of female connections. This multi-layered approach not only enhances the thematic richness of the novel but also underscores the fragmented and multifaceted nature of female relationships. This paper will examine Iris and Laura Chase's relationship, as well as the broader network of female characters, to explore how Atwood challenges traditional notions of solidarity and reveals the underlying tensions within these bonds. The analysis will focus on how Atwood's narrative exposes the limitations and possibilities of female intimacy, offering insights into how female characters navigate their social and personal constraints.

Through this critical examination, the paper aims to highlight how *The Blind Assassin* redefines the potential and constraints of female bonding, providing a reflective commentary on the implications for women's agency and identity within a patriarchal framework. By engaging with Atwood's complex portrayal of female relationships, this

analysis seeks to contribute to a deeper understanding of how literature can illuminate the multifaceted nature of female connections and the societal forces that shape them.

2 LITERATURE REVIEW

“A commemoration of wounds endured and resented” [1]: Margaret Atwood’s *The Blind Assassin* as feminist memoir. Bouson’s article explores Atwood’s novel through the lens of feminist theory, focusing on how the text functions as a memoir that commemorates personal and collective wounds. Bouson argues that *The Blind Assassin* reflects feminist themes by depicting the struggles and resistances of its female characters. The analysis highlights how the novel serves as a narrative that critiques patriarchal structures and represents women’s experiences of oppression and agency. The laugh of the Medusa. In “The Laugh of the Medusa,” [2] Cixous presents foundational ideas in feminist literary theory, particularly the notion of *écriture féminine* (feminine writing). While not exclusively about *The Blind Assassin*, Cixous’ theories provide a critical framework for understanding Atwood’s narrative strategies and feminist themes. The essay’s ideas can help contextualize the feminist dimensions in Atwood’s work, especially regarding the representation of female identity and voice.

Myths of war and peace [3]: Margaret Atwood’s *The Blind Assassin* and Ann-Marie MacDonald’s *Fall on Your Knees*. Gillett’s comparative analysis of *The Blind Assassin* and Ann-Marie MacDonald’s *Fall on Your Knees* examines how both novels engage with myths of war and peace. Gillett explores how Atwood’s novel uses historical and mythical frameworks to address themes of conflict, memory, and identity. This comparative approach enriches the understanding of Atwood’s thematic concerns within a broader literary and cultural context.

Love, concealment, and Laura Chase: Review of *The Blind Assassin* [4]. *An Artful Sequence of Words*. Gould’s review provides a detailed critique of Atwood’s novel, focusing on the themes of love and concealment as they relate to the character of Laura Chase. The review offers insights into the novel’s narrative complexity and the interplay between personal and historical narratives. Gould’s perspective is valuable for understanding the intricacies of Atwood’s storytelling and the novel’s thematic richness.

From an obscured gaze to a seeing eye? [5] Iris as victim, villain, and avenger in the role of writer-as-assassin in Margaret Atwood’s *The Blind Assassin*. Hembrough’s article examines the character of Iris in *The Blind Assassin* through the metaphor of the writer-as-assassin. Hembrough argues that Iris embodies multiple roles—victim, villain, and avenger—reflecting the complexities of her narrative voice and perspective. This analysis sheds light on Atwood’s use of unreliable narration and the thematic implications of Iris’s role within the novel.

Waiting for the end: Closure in Margaret Atwood’s *The Blind Assassin*. Ingersoll’s study focuses on the theme of closure in *The Blind Assassin* [6]. The article explores how the novel’s multiple narrative layers and complex structure contribute to its exploration of resolution and endings. Ingersoll’s analysis provides insights into how Atwood constructs narrative closure and the impact of this construction on the reader’s understanding of the text.

This literature review highlights the diverse critical approaches to *The Blind Assassin*, from feminist readings and thematic analyses to narrative structure and character studies. Each source contributes to a deeper understanding of Atwood’s novel and its place within contemporary literary discourse.

3 RESEARCH METHODOLOGY

When researching “Entangled Femininities: The Complexities of Female Bonding in Margaret Atwood’s *The Blind Assassin*,” your methodology should be designed to comprehensively explore how female relationships and bonding are depicted and how they contribute to the novel’s broader themes. Here’s a structured approach to developing your research methodology:

1. Research Design

Qualitative Analysis: Given the thematic focus on female bonding and complexities, a qualitative approach is most appropriate. This allows for an in-depth exploration of characters’ relationships, narrative structure, and thematic elements.

2. Literature Review

Conduct a thorough review of existing literature on *The Blind Assassin* to understand current interpretations and identify gaps in the analysis of female bonding and relationships.

Include feminist literary theory, theories of female friendship, and critical discussions of female characters in literature.

3. Theoretical Framework

Feminist Literary Theory: Use feminist theory to examine how gender and power dynamics shape female relationships in the novel.

Theories of Female Bonding: Incorporate theories on female friendship and bonding to analyze the nature of relationships between female characters.

4. Data Collection

Textual Analysis: Perform a close reading of *The Blind Assassin*, focusing on passages that depict female relationships, interactions, and character development. Pay particular attention to dialogue, narrative voice, and symbolic elements.

Character Analysis: Analyze the relationships between key female characters such as Iris and Laura Chase, and their influence on the narrative and themes of the novel.

5. Analytical Methods

Thematic Analysis: Identify and analyze themes related to female bonding, such as solidarity, rivalry, and betrayal. Explore how these themes are developed through narrative and character interactions.

Narrative Analysis: Examine how Atwood's narrative structure (e.g., the use of multiple perspectives and unreliable narration) impacts the portrayal of female relationships.

Symbolic and Metaphorical Analysis: Investigate the use of symbols and metaphors related to femininity and bonding. Consider how these elements contribute to the novel's exploration of female identity and relationships.

6. Comparative Analysis

Compare Atwood's depiction of female bonding in *The Blind Assassin* with other literary works by Atwood and other authors. This can provide insights into how unique or representative Atwood's portrayal is within the broader literary context.

7. Data Interpretation

Contextualize Findings: Place your findings within the broader context of feminist literary criticism and theories of female bonding.

Discuss Implications: Explore the implications of your findings for understanding female relationships in literature and how Atwood's novel contributes to this discourse.

8. Ethical Considerations

Ensure that interpretations and analyses are conducted with respect for the text and its characters. Avoid imposing external biases on the narrative.

9. Limitations

Acknowledge any limitations in your study, such as potential biases in interpretation or constraints due to the scope of the research.

10. Conclusion and Recommendations

Summarize key findings regarding the complexities of female bonding in *The Blind Assassin*.

Offer recommendations for further research on female relationships in literature or additional studies on Atwood's works.

This methodology will help you systematically explore the intricacies of female bonding in *The Blind Assassin* and contribute to a deeper understanding of Atwood's narrative techniques and thematic concerns.

4 RESULTS AND DISCUSSION

4.1 The Narrative Technique and Female Bonding

In *The Blind Assassin*, Margaret Atwood utilises several narrative techniques to explore and portray female relationships. Atwood employs a layered narrative structure with multiple perspectives that enrich the portrayal of female relationships. The novel intertwines a contemporary story with a fictional narrative within the novel. The primary story is told from the viewpoint of Iris Chase, an elderly woman reflecting on her past, while the embedded novel, also titled *The Blind Assassin*, offers a fictional account that parallels and contrasts with Iris's life. This dual narrative allows readers to see the complexities of female relationships from different angles, particularly how Iris's relationships with her sister Laura and other women evolve over time and under different circumstances. The fragmented nature of the narrative, shifting between past and present, as well as between different narrative forms (such as letters, newspaper clippings, and the embedded story), mirrors the fractured and multifaceted nature of Iris's relationships. "Atwood deftly weaves together the various strands of her narrative, slowly revealing the unsettling connections between past and present and the world of social reality and science fiction, she calls attention to the endless repetition of class warfare and violence against women" [1].

This fragmentation reflects the way in which memories and relationships are often pieced together from various perspectives, highlighting the complexity and ambiguity of female bonds. Narrative is not only fragmented but also unreliable. The unreliable narrator creates a "bonding" effect [7]. This occurs when the reader feels engaged or even complicit in uncovering the truth behind the narrator's inconsistencies or omissions. The narrator's unreliability invites the reader to actively participate in constructing the story's meaning or to empathize with the narrator's perspective, even if flawed. Nünning highlights that the unreliability often found in fictional narratives is not seen as threatening or problematic to the audience. Unlike in real-life contexts where unreliable information can lead to misunderstandings, in fiction, it is part of the creative experience. "The narrative becomes metafictional not only in the mis-en-abyme effect of its novel-within-a-novel construction, but also in its masquerading as a novel being generated before the reader's eyes." (Ingersoll, 2003: 546) Readers are generally aware that they are engaging with a constructed narrative that unreliable narration brings does not mislead them. "The greatest difference is that unreliability in fictional narratives does not pose any threat to the audience" [8].

Atwood uses inner monologue and stream of consciousness techniques to delve into Iris Chase's thoughts and feelings. This approach provides an intimate look at Iris's internal struggles and her evolving perceptions of her relationships with other women, such as her sister Laura and her daughter, as well as her complicated relationship with her husband. These techniques offer insight into how Iris processes and re-evaluates her relationships over time. The embedded novel within *The Blind Assassin* serves as a metafictional element that comments on and parallels Iris's own story. This fictional story within the story, which features a female protagonist and themes of escape and entrapment, reflects and amplifies the issues Iris faces in her own life. It provides a commentary on the roles and constraints imposed on women,

both in the fictional narrative and in the real world of Iris's life. Atwood uses rich symbolism and imagery to explore female relationships. For example, the recurring motif of the blind assassin, as well as the various references to eyes and sight, symbolise both the clarity and blindness that can characterise female connections. These symbols underscore the themes of perception, revelation, and concealment in Iris's relationships.

The novel includes letters and other documents that provide different perspectives on the characters and their relationships. These elements offer additional viewpoints on Iris's interactions with her sister Laura and other key figures, adding depth to the portrayal of their relationships. Atwood's narrative techniques in *The Blind Assassin* create a rich and complex portrayal of female relationships, highlighting their intricacies, conflicts, and enduring significance. The use of multiple perspectives, fragmented narratives, and symbolic elements all contribute to a deeper understanding of how women relate to one another across different times and circumstances.

Atwood's narrative structure amplifies this complexity by embedding multiple layers of storytelling within the novel. The presence of the fictionalized science fiction tale within *The Blind Assassin*—written by Laura and featuring star-crossed lovers fleeing from an oppressive regime—serves as a parallel narrative that both mirrors and distorts the sisters' lived experiences. This metafictional element provides readers with insights into Laura's inner world, offering glimpses of her suffering, her desires, and her interpretation of the events that shaped her life. Yet, because these stories are mediated through Iris's recounting, they become doubly filtered—once through Laura's imagination and again through Iris's memory. This layered narrative approach complicates the quest for redemption by emphasising the subjective nature of memory and the difficulty of ever truly knowing another person's truth.

4.2 The Role of Sisterhood

Margaret Atwood's *The Blind Assassin* intricately explores the theme of sisterhood, interweaving it through a complex tapestry of memory, trauma, love, and betrayal. Through the nuanced relationship between the sisters Iris and Laura Chase, Atwood dissects the psychological, social, and emotional dimensions of sisterhood, ultimately presenting it as a multifaceted bond. The complexity of this bond is illustrated in Iris's protective instincts and her deep sense of duty toward Laura, which is rooted in both affection and obligation. This complexity is captured in Iris's reflection: "I couldn't let her see how much I was suffering. She had to believe I was strong, that I could protect her, always" [9]. Atwood employs the relationship between Iris and Laura to explore how sisterhood is shaped by a combination of loyalty, guilt, and the struggle for individual identity. This is an integral part of twentieth century feminism to show the survival of women on same sex. In the same way, this survival is necessitated by its dependence 'écriture féminine'. In her influential essay "The Laugh of the Medusa," Cixous argues that women have been systematically excluded from the literary canon and denied the means to express their own experiences and identities. She states that women must bring themselves into writing within this framework; Margaret Atwood's novel can be interpreted as an embodiment of Cixous's demand for female self-representation. Iris Chase, the protagonist and narrator, uses the form of a fictional autobiography to assert her presence. "Woman must put herself into the text -as into the world and into history -by her own environment." (1976, 875)

From the outset of *The Blind Assassin*, Iris Chase is depicted as the protector of her younger sister, Laura. The early death of their mother and their father's emotional withdrawal thrust Iris into a quasi-parental role. As a teenager, Iris assumes the responsibility of caring for Laura, a role that forces her to mature rapidly and prioritize her sister's needs above her own. In her narrative, Iris frequently reflects on her role as Laura's caretaker following their mother's death. She notes, "I had to be the one who looked after her, kept her in line, made sure she didn't get into trouble or disgrace us in some way. I was the one who was responsible" (Atwood, 89). This passage not only underscores Iris's sense of duty but also hints at the burden of responsibility she feels toward Laura. The phrases "kept her in line" and "didn't get into trouble" imply that Iris perceives her role as one of constant vigilance and correction, revealing the strain of this obligation on her own sense of self.

This responsibility is further compounded by the social and familial expectations imposed on Iris. Her role as Laura's protector is not merely a personal choice; it is shaped by the societal norms of the period and the pressures arising from their deteriorating family circumstances. As J. Brooks Bouson observes, "Iris enacts the role of the dutiful and self-sacrificial daughter when she enters a paternally arranged marriage..." (Bouson, 252). This observation underscores how Iris's actions are driven by a sense of duty imposed by her father and the broader societal expectations of women. In agreeing to marry Richard Griffen, a wealthy industrialist, Iris is making a profound personal sacrifice not out of love but out of a perceived necessity to protect Laura and secure their future. This sense of duty and sacrifice is critical to understanding the psychological dimensions of Iris's character and her relationship with Laura.

As the narrative progresses, Iris reflects on her efforts to shield Laura from the harsh realities of their family's financial decline and their father's deteriorating mental state: "I kept most things from her — the worst things, the things that would have done her in. I wanted to keep her in a cocoon, safe from harm" (Atwood, 145). This statement demonstrates Iris's profound desire to protect Laura from painful truths, underscoring her protective nature. Yet, this protection exacts a cost, both for Iris, who must bear the weight of these secrets alone, and for Laura, who remains in a state of naïveté. By sheltering Laura from the darker realities of their lives, Iris also prevents her from fully understanding their circumstances and developing the resilience necessary to navigate them. This dynamic reveals the inherent tension in their relationship: while Iris's actions are motivated by love and concern, they also reflect a paternalistic approach that restricts Laura's growth and autonomy.

Iris's protective instincts are further complicated by the love she feels for Laura, which is intertwined with feelings of resentment and guilt. The marriage to Richard Griffen, orchestrated by their father, is depicted as the ultimate act of self-sacrifice by Iris. She is willing to compromise her happiness and personal freedom for the sake of protecting Laura from poverty and instability. This decision weighs heavily on Iris, as she finds herself trapped in a loveless and oppressive marriage. "Iris insists that marrying Richard is the sensible thing to do, even though she is filled with dread at the thought of her approaching marriage" (Bouson, 257). This sense of dread reflects the emotional toll of her decision, suggesting that her sense of duty to Laura overrides her own desires and needs.

Furthermore, the theme of sisterhood in the novel is also defined by an underlying sense of betrayal. While Iris is committed to protecting Laura, she also makes choices that betray her own desires and well-being. This internal conflict becomes a central aspect of Iris's character and adds to the complexity of their relationship. As Elizabeth Gould notes, Iris is "weighed down by her father's love as well as the responsibility for the younger and too trusting Laura, a responsibility thrust upon her by parents and housekeeper Reenie" (Gould, 2017). This responsibility is not only externally imposed but is also internalized by Iris, who views herself as Laura's guardian, even at the cost of her own happiness.

Atwood further complicates the theme of sisterhood by exploring the psychological effects of these sacrifices on Iris. The burden of responsibility she carries is compounded by a sense of guilt that persists into her old age. She is continually haunted by the choices she made and their impact on Laura's life. This unresolved guilt suggests that Iris's role as protector is as much a prison for her as it is a source of strength. Her narrative, filled with reflections and justifications, is an attempt to make sense of her past actions and their consequences.

The narrative structure of *The Blind Assassin* also enhances the exploration of sisterhood. The novel's fragmented structure, shifting between Iris's first-person account, Laura's posthumous novel within the novel, and various historical documents, mirrors the disjointed and often contradictory nature of Iris's recollections. This narrative style emphasizes how memory, trauma, and guilt shape Iris's perception of her sister and their relationship. By presenting the story in this manner, Atwood allows the reader to perceive the layered complexity of their bond, which is characterized by both profound love and deep-seated pain.

In sum, Margaret Atwood's *The Blind Assassin* presents sisterhood as a deeply complex and multifaceted bond, shaped by a combination of loyalty, love, duty, guilt, and betrayal. Through the relationship between Iris and Laura Chase, Atwood delves into the psychological, social, and emotional dimensions of sisterhood, revealing it to be a connection that is constantly evolving under the pressures of external circumstances and internal conflicts. Atwood's narrative techniques, including her use of metafiction and fragmented storytelling, further enrich this exploration, providing a profound commentary on memory, trauma, and the inescapable ties that bind.

4.3 Guilt and Haunting Legacy of Sisterhood

Margaret Atwood's *The Blind Assassin* delves deeply into themes of guilt and redemption, particularly as they relate to the complex dynamics of sisterhood. At the heart of the novel lies Iris Chase's profound sense of guilt over her sister Laura's tragic death. "I should have known what she would do, but I didn't. I should have taken better care of her. All I could think of was how much I wanted to be out of that house. I did it for money. I was her sister. I should have seen it coming." (55) This guilt permeates the narrative and serves as a driving force behind Iris's actions and decisions, especially her decision to write her memoirs. Iris's sense of responsibility for Laura's death is multifaceted and layered; she feels culpable for a range of choices she made throughout their lives, from her marriage to Richard Griffen, a manipulative and controlling man, to her own extramarital affair with Alex Thomas. "I thought I was doing the right thing for both of us, for Laura and me. But it wasn't right; it was a trap. I see that now. It was a trap for Laura." (112) Ultimately, Iris is haunted by her survival when Laura did not, and Atwood uses this pervasive guilt as a central theme to explore the possibilities—and limitations—of redemption through storytelling. "How could I have let it happen? If I hadn't been so blind, if I hadn't been so wrapped up in my own grief and longing. Laura needed me, but I was not there for her." (273)

Iris's guilt is not a single-dimensional feeling but a complex and evolving sentiment that manifests itself in various forms throughout the novel. Atwood presents this guilt as something that haunts Iris continuously, shaping her present and coloring her interpretation of past events. The most powerful aspect of Iris's guilt is her sense of failure as an older sister who was unable to protect Laura from the abuses and manipulations of Richard Griffen, her husband. Marrying Richard was a decision initially made to secure the financial future of the Chase family, but Iris soon realizes the cost of this decision in terms of Laura's wellbeing. Richard's manipulative and predatory behavior towards Laura is something Iris becomes aware of only later, and her inability to shield her sister from his advances becomes one of the most searing sources of her guilt.

Additionally, Iris feels guilty for her affair with Alex Thomas, a revolutionary writer who captivates both sisters. The affair is not merely an act of personal betrayal but also a factor that contributes to Laura's emotional turmoil. Laura's affection for Alex is palpable, and Iris's clandestine relationship with him further strains the fragile relationship between the sisters. The affair symbolizes Iris's pursuit of a fleeting personal happiness, but it simultaneously becomes a source of anguish for Laura, contributing to her psychological unraveling. "I was thinking about myself, not about what it would do to Laura. I should have known better; I should have been more careful. But I was lonely, and I was selfish." (362) For Iris, the guilt of having a relationship with Alex that potentially exacerbated Laura's instability lingers heavily, amplifying her sense of responsibility for her sister's tragic fate.

Iris's decision to write her memoirs, a narrative interspersed with her reflections and memories, becomes both a confession and an attempt at redemption. "I write these words now in the hope that by telling the truth, I might bring some justice to Laura. She was the good one, the innocent one, and I was the one who failed her." (p. 408) Atwood presents storytelling as a potential means for Iris to confront her guilt and seek absolution, both for herself and on behalf of Laura. The act of writing allows Iris to delve into her past, recounting the events leading up to Laura's death in an effort to understand them better and to explain her actions to herself and to a broader audience. By documenting her life and the choices she made, Iris hopes to offer a posthumous form of justice to Laura, whose life was cut short and whose voice was silenced. "I wanted it to be her voice, Laura's voice, but it ended up as mine. Or maybe it's both of ours, intertwined and inseparable. I can no longer tell where she ends and I begin." (p. 421) Through this act, Atwood suggests that storytelling itself can serve as a powerful form of redemption—a means to reclaim agency, confront unresolved guilt, and seek forgiveness. Iris's memoir can be viewed as a plea for understanding, a narrative constructed in the hope that the reader, or perhaps Laura herself from beyond the grave, might absolve her. Nevertheless, Atwood makes it clear that redemption is not easily achieved. Iris's attempts to come to terms with her past are constantly undermined by her own unreliable memory and by the fact that Laura's version of events is forever lost to time. The memoir becomes an incomplete and ambiguous document, one that reflects the inherent difficulties of fully understanding or atoning for past actions. Atwood uses this ambiguity to explore the limits of redemption and to highlight how guilt can persist, unresolved and unacknowledged, through generations. The fragmented narrative structure and the unreliable nature of Iris's recollections suggest that some truths are irretrievable, and some wounds cannot be healed. However, Atwood complicates this process of redemption by intertwining Iris's memoir with the novel within the novel, *The Blind Assassin*, a work attributed to Laura but published under Iris's name after Laura's death. This metafictional layer serves as a poignant reminder of the complexities of the sisters' relationship and the deep entanglement of their identities. By publishing Laura's novel under her own name, Iris both preserves and erases Laura's voice—an act that further complicates her feelings of guilt and attempts at redemption. The inner narrative becomes a reflection of Laura's psyche, and yet it is mediated through Iris's own perspective, blurring the lines between whose story is truly being told. In many ways, Iris's memoir can be interpreted as an attempt to restore Laura's story to its rightful owner, to acknowledge her sister's pain and give her a voice that was denied in life. Through this, Atwood posits that sisterhood, despite its inherent tensions and conflicts, holds the potential for understanding and reconciliation, even in the shadow of profound guilt.

Atwood also emphasizes that the pursuit of redemption can be an isolating journey, particularly when the individual grapples with self-recrimination and the irreversibility of their actions. Iris's sense of isolation is heightened by her role as the last surviving member of the Chase family, burdened with the task of bearing witness to her family's disintegration and her own perceived failures. "I thought I could write my way out of it, but it's not that simple. There is no undoing what was done. I can only tell my side of it, my half of the story." (p. 511) Her memoir becomes a solitary exercise in reflection and atonement, a written testimony to a life marked by decisions she cannot change and a sister she cannot bring back. In writing her story, Iris is not only grappling with her own culpability but is also attempting to wrestle with the broader implications of memory, history, and narrative control.

Atwood's *novel* presents a nuanced exploration of guilt and redemption within the context of sisterhood. Iris Chase's haunting sense of responsibility for Laura's death drives the narrative forward, compelling her to write her memoirs as both a confession and a plea for forgiveness. "Every night, I lie awake, thinking of Laura. I see her face, hear her voice. She would speak to me, if she could, and what would she say? Would she forgive me?" (p. 478) However, Atwood's layered narrative structure, with its unreliable narrator and its story within a story, complicates this journey toward redemption. Through Iris's fragmented and subjective account, Atwood interrogates the possibility of truly understanding the past or reconciling with it. "Our lives were bound together like a twisted cord. I thought I could cut myself free, but now I see that it was never possible. She was always a part of me, and I of her." (556) In doing so, she reveals that redemption is not a guaranteed or even a fully attainable outcome but rather a continuous and fraught process of self-examination, storytelling, and, ultimately, acceptance of the ambiguities that define human experience.

Gillett has approached this guilt in a different direction, he believes iris has exposed her sister to the "pedophilic attentions of her status-hungry husband" (2012: 10) It suggests that Iris has put her sister in a vulnerable position, allowing her husband, who is portrayed as predator, to exploit her sister. This choice of language implies a significant level of responsibility on Iris's part, suggesting that she is not merely a passive observer but an active agent who, through negligence or willful ignorance, has failed to protect her sister from harm. The harshness of this interpretation emphasizes the ethical and moral complexities of Iris's role, as she is positioned either as a passive enabler or an active participant in her sister's exploitation. The phrase "exposed her sister" indicates that Iris has made a conscious or unconscious decision to place her sister in harm's way, leading to a betrayal of familial duty and trust. This betrayal is not a minor oversight but a fundamental failure of her responsibilities as a sister and a protector. By allowing her sister to be subjected to the predatory nature of her husband, Iris becomes a part of the destructive cycle of abuse and manipulation. Her lack of action—whether motivated by fear, a desire to maintain the social status quo, or sheer ignorance—reveals a troubling moral ambiguity. The concept of betrayal here is not simply about a failure to act; it suggests an emotional and psychological distance that has allowed Iris to prioritize other concerns, such as her marriage or her societal role, over the safety and well-being of her sister.

However, Atwood's portrayal of Iris is more nuanced than Gillett's interpretation allows. While Iris can be seen as complicit in her husband's actions, this complicity is intertwined with her own sense of powerlessness. Trapped in a loveless marriage with Richard, who is manipulative and abusive, Iris is constrained by the very structures that demand

her loyalty. Her loyalty to her husband though rooted in societal expectations and possibly self-preservation, directly conflicts with her loyalty to her sister. This conflict reflects Atwood's exploration of the complexities of loyalty within familial and marital relationships. Iris's inability to fully protect her sister, Laura, is not merely a consequence of negligence but also of her own victimization within a patriarchal and oppressive marriage. Iris's protective instincts, while genuine, often result in choices that inadvertently contribute to Laura's suffering. This contradiction highlights the paradox of sisterly loyalty that Atwood seeks to explore: it is not simply a matter of love or devotion but is shaped by external pressures and internal conflicts. Iris's loyalty is further complicated by the broader social and familial expectations that surround her. As Richard's wife, she is expected to uphold a certain image and maintain the stability of her marriage, even at the expense of her sister's safety. The complexity of this situation is evident when Iris fails to prevent Laura from discovering the truth about Richard's abuse, a revelation that leads to Laura's emotional breakdown and eventual suicide. In this sense, Atwood presents sisterly loyalty as a double-edged sword—it can be both a source of strength and a burden that leads to profound psychological distress.

The notion of loyalty as a form of entrapment is a recurring theme in Atwood's work. For Iris, loyalty is inextricably linked to silence. She chooses to remain silent about many of the truths she knows—Richard's predation, her affair with Alex Thomas, and her knowledge of Laura's suffering—out of a misguided sense of duty to protect Laura from even harsher realities. However, this silence ultimately contributes to Laura's isolation and despair. Atwood shows how loyalty, when coupled with secrecy, becomes a corrosive force that undermines the very relationships it seeks to preserve. This is evident in the way Iris's silence not only fails to protect Laura but also facilitates her continued victimization. The protective silence Iris maintains is, in reality, a tool of oppression, serving the interests of the abuser rather than the abused.

by suggesting that it is intertwined with personal survival. Iris's loyalty to Laura, while deep Atwood complicates the notion of sisterly loyalty further, is not enough to overcome her entrapment in a life dominated by Richard's control. Her decisions are often dictated by her need to survive within the confines of her marriage, where her autonomy is severely restricted. The irony is that while Iris believes she is protecting Laura by staying silent, she is, in fact, enabling Richard's predatory behavior and perpetuating the cycle of abuse. This contradictory dynamic reveals the limitations of traditional notions of loyalty, especially within patriarchal structures that prioritize male authority and control over female agency and solidarity. The relationship between Iris and Laura is emblematic of Atwood's broader critique of societal norms that govern women's behavior and relationships. In many ways, their relationship is a microcosm of the struggles faced by women who are caught between competing loyalties—to their families, to societal expectations, and to themselves. Iris's internal conflict is a manifestation of this broader struggle. She is torn between her duty as a wife and her responsibility as a sister, between her desire for personal freedom and the expectations imposed upon her by society. Her failure to navigate these conflicting loyalties without causing harm to herself and Laura speaks to the broader theme of female disempowerment in a patriarchal world.

Moreover, Atwood does not let Iris off the hook entirely. While she is a victim of her circumstances, she is also complicit in maintaining the very structures that oppress her. Her silence and inaction, while understandable given her situation, are also forms of complicity that have real and devastating consequences for Laura. Atwood thus raises important questions about the nature of agency and the extent to which individuals are responsible for their actions within oppressive systems. While Iris is certainly constrained by her circumstances, she also makes choices that contribute to Laura's suffering. This ambiguity is what makes her character so compelling and tragic—she is both a victim and, to some extent, a perpetrator.

Gillett's interpretation of Iris as a figure of betrayal and complicity in her sister's exploitation offers a harsh but necessary perspective on the dynamics at play. However, Atwood's narrative provides a more nuanced exploration of these dynamics, showing how loyalty, power, and silence intersect in complex ways. Iris is not simply a villain or a passive bystander; she is a deeply flawed character whose actions are shaped by both her circumstances and her inner conflicts. Her story is one of moral ambiguity, where love and loyalty are entangled with betrayal and harm. Atwood challenges the reader to consider the limits of agency and the consequences of silence in the face of exploitation, ultimately presenting a narrative that is as thought-provoking as it is unsettling.

5 CONCLUSION

Atwood's portrayal of female relationships in her novels is marked by an intricate web of entanglements—of love, rivalry, solidarity, betrayal, and survival—that challenge simplistic notions of sisterhood or female unity. Her narratives often delve into the power dynamics, societal expectations, and psychological conflicts that shape women's lives and their interactions with each other. Atwood complicates the notion of female bonding by showing how it is influenced by intersecting forces of patriarchy, social expectations, and personal traumas. These forces create a web of entangled femininities, where loyalty can morph into complicity, love into control, and protection into oppression. The relationships between Atwood's female characters reveal how societal pressures and internal conflicts limit their agency, forcing them to navigate their identities and loyalties within oppressive structures. This results in relationships that are as much about survival as they are about solidarity, demonstrating that female bonding is a dynamic and contested space within Atwood's fiction. Ultimately, Atwood's work does not provide a singular definition of female relationships; rather, it challenges readers to reconsider the complexities of women's experiences with each other. Atwood's portrayal suggests that true solidarity among women requires confronting these complexities—recognizing the strength and the fragility of their bonds, the necessity for empathy, and the courage to break the silences that so

often sustain cycles of harm. In doing so, Atwood opens up possibilities for understanding femininity not as a monolithic experience, but as a varied and evolving negotiation of power, identity, and resistance.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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RESEARCH ON THE NATIONAL IMAGE COMMUNICATION OF THE YELLOW RIVER CULTURE FROM THE PERSPECTIVE OF RECEPTION AESTHETICS

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Abstract: The Yellow River culture, rich in content and steeped in history, serves as a representative symbol of the Chinese nation and an iconic emblem of Chinese civilization. On the basis of accurately grasping the connotation of the Yellow River culture, how to construct production spaces and consumption scenarios for cultural narratives through the Yellow River National Cultural Park is of great significance for promoting the creative transformation and innovative development of traditional Chinese culture, as well as facilitating cultural exchanges and mutual recognition. To narrate China's stories through the Yellow River culture, we should base ourselves on the organic unity of the commonalities of the Yellow River culture and the cultural individualities of its upstream, midstream, and downstream regions. We should delve into the cultural genes of the Chinese nation embodied in the Yellow River's cultural heritage and highlight the values of Chinese civilization signified by the Yellow River's cultural symbols. On this foundation, we should further clarify the spatial construction principles of the Yellow River cultural narrative, grasp the dimensions of the spatial field of the Yellow River cultural narrative, and establish the basic scenarios of the Yellow River National Cultural Park. Meanwhile, we should formulate fundamental strategies for disseminating China's national image through the Yellow River culture, continuously enhancing its dissemination power and influence.

Keywords: Yellow river culture; Cultural genes; China's stories

1 INTRODUCTION

The Yellow River, China's longest river alongside the Yangtze, is honored as one of the "mother rivers" of the Chinese nation. It has nourished the early civilizations of the land and is considered a significant birthplace of the Chinese people[1]. The river originates in the northern foothills of the Bayan Har Mountains on the Qinghai Plateau in the west and flows eastward, passing through the Loess Plateau, Inner Mongolian Plateau, and North China Plain before emptying into the Bohai Sea, spanning approximately 5,464 kilometers. Along its course, the Yellow River receives numerous tributaries, with the Wei River on the north bank and the Luo River on the south being the largest[2]. The Yellow River basin, covering an area of about 750,000 square kilometers, is a critical source of water and a base for agricultural production in China. It is also one of the cradles of Chinese civilization, bearing a rich heritage of historical and cultural significance.

The Yellow River culture is ancient, with extensive and diverse branches that contribute to the development and richness of the Yellow River cultural community[3]. This has made the Yellow River culture a representative symbol that encapsulates the cultural genes of the Chinese nation, characterized by its diverse unity[4]. Unlike regional cultures such as the Jingchu culture or Jiangnan culture, which emphasize regional characteristics, the Yellow River culture embodies the shared cultural genes of the Chinese nation's integration, evolution, and inheritance.

2 THE CULTURAL GENES OF THE CHINESE NATION EMBEDDED IN YELLOW RIVER CULTURE

The cultural genes of the Chinese nation contained within the Yellow River culture can be understood through three dimensions: the subject dimension of unity, the cognitive dimension of interconnectedness, and the practical dimension of diligence. These dimensions form the intrinsic core of using the Yellow River culture to tell China's story effectively.

2.1 Emphasis on Unity

Stemming from the pursuit of cultural subjectivity, humanity has continually shaped cultural rituals, intensified cultural expressions, internalized cultural traditions, and absorbed foreign cultural elements in a self-constructive manner. This process satisfies individuals' needs, imparts life skills, expands survival conditions, and perpetuates ethnic lineages. Over the ten-thousand-year cultural evolution in China, the continuous exchange and blending among various ethnic groups have fostered a shared cultural value, giving birth to a culturally inclusive and internally unified community[5]. This community embodies the pluralistic yet unified value core and cultural traits of Chinese civilization, making it the only uninterrupted, historically consistent, and continuously evolving civilization in the world.

The Yellow River basin, as a crucial cradle of the Chinese nation, boasts a cultural development characterized by regional diversity, interconnectivity, and value coexistence. It exemplifies the vitality of Chinese culture's pluralistic creativity, inclusiveness, and enduring development[6]. On the one hand, the rich regional cultures formed along the

upper, middle, and lower reaches of the Yellow River fully demonstrate the multicultural creativity of Chinese culture, reflecting the cultural continuity and accumulation achieved by different ethnic cultural subjects in their pursuit of development and prosperity throughout history. On the other hand, the Yellow River culture, during the historical process of the Chinese nation's integrated development, has forged the deep-seated cultural concept of "emphasizing unity", which signifies mutual dependence, an emphasis on the whole, and solidarity. This concept has become a shared value that unites cultural subjects, resonates deeply in people's spiritual world, and constitutes an essential cultural gene of the Chinese nation.

Preserving the Yellow River culture, inheriting its millennia-old cultural lineage, and showcasing the cultural spirit of the Chinese nation and the vitality of Chinese civilization fundamentally entails highlighting the value-sustaining power of the Yellow River culture's emphasis on unity and seeking common ground, its spirit of national unity, and its soul of Chinese rejuvenation, all while presenting its diverse and rich cultural forms.

2.2 Seeking Connection

The formation and development of culture represent an evolutionary process through which people express meaning through objects, symbols, or behaviors. This process embodies the gradual and complex nature of human cognitive activities, reflecting the dynamic interplay between the subjective spiritual world and the objective material world. From a cognitive perspective, diverse cultures strive to answer fundamental questions about nature, survival, self-identity, and community dependence. Through interactions and intergenerational transmission, these cultures continually deepen and expand their cognitive accumulations, shaping shared ways of thinking and living within a particular geographical region or ethnic group. The rich diversity of Chinese culture's origins is characterized by a flourishing of ideas and a multi-faceted progression, while its evolution has seen a gradual blending of these diverse elements into a unified whole. At its core, this cultural cognition underscores the logic of "seeking connection".

The Yellow River basin and the Yangtze River basin serve as the interconnected origins of Chinese culture, where advanced agricultural civilizations flourished, giving rise to a general pattern of rice cultivation in the south and millet cultivation in the north. Over the long historical course of accumulating and enriching cultural cognition, a way of thinking that connects natural order with cultural understanding gradually emerged, evolving into the unique "cosmopolitan view" of traditional Chinese culture. This cognitive logic of seeking connection transformed into a social logic of seeking common ground. As articulated in the concept of "Great Harmony Under Heaven", it envisions a harmony achieved through natural order, enabling individuals to fulfill their potential and fostering harmony between humans and nature, among humans themselves, and between humans and all things in the universe.

The cognitive logic of seeking connection is a vital cultural gene of the Chinese nation, underpinning the fundamental principles of traditional Chinese medicine. It also serves as a cultural pillar in various aspects of Chinese politics, economics, and society, with notions like "political harmony and people's contentment", "governing for the benefit of the people", and "harmony in the family brings prosperity to all" deeply ingrained in people's minds[7]. The Yellow River, as a vital artery traversing China from east to west, plays a significant role in cultural blending and economic connectivity. It serves as a waterway and cultural bridge connecting the vast regions north and south of the river, embodying the cultural logic of seeking connection that showcases the unique charm, wisdom, and global influence of Chinese culture.

2.3 Emphasizing Diligence

Culture in human life transcends merely being a spiritual existence of ideas; it also permeates daily production and lifestyle, embodying an externalized practical dimension. Internalizing knowledge and externalizing it through action constitute the essence of an individual's realization of the unity of knowledge and practice grounded in cultural heritage. The Chinese cultural heritage is deeply rooted in an agricultural-based mode of production, characterized by a daily rhythm of working with the sunrise and resting with the sunset, and a pursuit of abundant harvests and thriving livestock. Hard work and diligent labor are seen as prerequisites for bountiful rewards, with the belief that heaven rewards diligence serving as a cultural guide for self-actualization. Emphasizing diligence encapsulates the fundamental practical mechanism of agrarian culture, where adhering to the agricultural calendar and working with the seasons gradually internalizes into a cultural mindset ingrained in people's beliefs, becoming one of the fundamental dimensions for moral evaluation in agrarian societies.

Over the long evolution of Chinese culture, diligence has evolved into a traditional virtue of the Chinese nation. The emphasis on diligence, as a cultural gene, permeates people's hearts, with ideas and behaviors such as assiduous study and training, diligence leading to prosperity, diligent governance for the benefit of the people, and thrift in household management deeply etched into the fabric of traditional Chinese culture. In the Yellow River basin, where agriculture flourished and water transportation was convenient, the gene of emphasizing diligence has been passed down from generation to generation, enriching the Yellow River cultural heritage with profound historical connotations and embodying the solid foundation of Chinese culture.

In conclusion, from the perspective of the historical genesis and overall evolution of the Yellow River cultural heritage, the cultural genes of valuing unity, seeking connection, and emphasizing diligence are integrated into the multicultural fusion and inheritance of the Chinese nation, shared by various regional cultures. Examining the essence of Yellow River culture from its universal characteristics offers a concise and clear expression of its underlying values.

3 THE CHINESE AESTHETIC VALUES SYMBOLIZED BY THE YELLOW RIVER CULTURE

Civilization is the crystallization of culture, which, as a long-term evolutionary process, gradually constructs the cognitive understanding of relationships between objects and humans, as well as among humans, through the spiritual realm of human practice. This understanding continuously transforms into complex social relational structures, subsequently overlaying cultural relations onto social ones, fostering individuals with harmonious mind-body integration and cooperative communities, guiding humanity towards civilized societies[8]. The Yellow River culture, with its rich connotation and robust structure, has propelled the Chinese civilization forward from the depths of history, maintaining the continuity and stability of Chinese society through its outward assimilative mechanisms and inward-seeking balances.

As an iconic symbol of Chinese civilization, the Yellow River culture fundamentally establishes the value core that propels the continuous development of Chinese social civilization, manifesting the value support in its modern narrative and systematically presenting the fundamental values of Chinese civilization in a vivid and coherent manner. As an integral part of Chinese culture, the Yellow River culture embodies the cultural genes of valuing unity, seeking connection, and emphasizing diligence. The Chinese civilizational values symbolized by it can be unfolded through the process of progressively enhancing human capabilities from the exterior to the interior and then back out, highlighting the fundamental values in the construction of relationships between humans and nature, humans and the self, humans and technology, humans and society, as well as humans and civilization. This approach bridges the essence of traditional Chinese culture with the quintessence of socialist advanced culture.

3.1 Nature Outlook: Harmony of Heaven and Humanity Centered on Humanity

During its historical evolution, the Yellow River culture has gradually accumulated people's understanding of nature into a set of values that balance the relationship between humans and nature. As a typical region among the world's major river basins, the Yellow River valley entered the era of agrarian civilization relatively early, where adhering to the seasons and not missing the agricultural timings formed the basic norms of people's production and life[9]. Through long-term agricultural labor, the concept of "conforming to nature brings good fortune" became the core of the ancient Chinese cultural notion of "harmony between heaven and humanity."

As people's understanding of natural ecological laws deepened gradually, they began to utilize and transform nature while conforming to it, making it more conducive to human survival and development needs. This shifted the passive adaptation of "harmony between heaven and humanity centered on nature" towards proactive responsiveness in "harmony between heaven and humanity centered on humanity." Especially after industrialization's excessive exploitation and consumption of natural resources, contemporary people have become increasingly conscious of protecting the natural ecology. Humans are beneficiaries of nature, but even more so, protectors of it. Placing the ecological restoration of the Yellow River first and safeguarding the mother river of the Chinese nation has become the epochal melody of the Yellow River culture, embodying an ecological civilization value that underscores the harmonious coexistence between humans and nature.

3.2 Outlook on Life: Cultivate Oneself and Strive for Progress in One's Career

The Yellow River valley is the cradle of Chinese civilization, and the Yellow River culture has nurtured generations of people, exerting a lasting influence on shaping individual life purposes and meanings. From agrarian to industrial and then to information societies, Confucian ideas have consistently played a pivotal role in the Yellow River culture, with the concepts of self-cultivation, family harmony, governance, and world peace deeply rooted in people's minds. Self-cultivation and striving for progress have become the internal spiritual driving forces for individual growth.

Yellow River culture has inscribed the red genes into the pursuit of individual life values. The cause of socialism with Chinese characteristics has become the goal that contemporary people strive for diligently.

Integrating self-cultivation and striving for progress into the great rejuvenation of the Chinese nation is the resounding call of the times given by the Yellow River culture to individuals. The socialist core values of patriotism, dedication, integrity, and friendliness nurture individuals throughout their growth and development. As the great river flows eastward, washing away the heroes of the past, generation after generation of Chinese people have integrated their individual selves into the great national cause, which serves as a vivid portrayal of the life values transmitted by the Yellow River culture and also marks the interpretation of cultivating oneself and striving for progress in one's career for the continuous development of Chinese civilization.

3.3 Outlook on Development: Innovate Continuously and Progress through Wisdom

As human self-capabilities continue to enhance, the Yellow River culture has witnessed productivity, the fundamental driver of human civilization's progress, transforming people's production and lifestyles through the creation of technological tools. The interaction between humans and technology has constructed an inherent dimension of cultural development. The Yellow River valley is a representative region for the origin, development, and advancement of human agricultural technology, as well as a pioneering region for China's modern industrialization. The outlook on development that emphasizes innovation and revolution has infused the Yellow River culture with contemporary vitality.

Facing the tide of the new technological revolution worldwide, the cultural essence of pursuing technological innovation is recognized by the Yellow River cultural community, which focuses on enhancing its own intellectual capabilities. With the cultural concept of "innovate continuously and progress through wisdom," it promotes the high-quality development of the Yellow River Economic Belt. Under the premise of adhering to ecological protection, suitable industries must be developed to achieve scientific, orderly, and high-quality development. This necessitates people finding new paths for development with innovative thinking and boundless wisdom.

3.4 Moral Outlook: Reverence for Virtue, Inclination towards Goodness, and the Cultivation of Respect

The Yellow River culture is one that coexists with its watershed. The ever-flowing waterways intimately connect people, deepening moral conceptions that bind human relationships and underpinning the internal ethics that maintain social order during the formation of communities of shared interests.

Human moral values unify individual with collective interests. Culture plays a fundamental role in instilling moral lessons of good and evil across generations. In the historical interplay between the Yellow River and Yangtze River cultures, the core Confucian concept of benevolence has profoundly penetrated Chinese culture, with reverence for virtue, striving towards goodness, and emulating the virtuous becoming the fundamental ideals and practical guidelines for individual moral cultivation.

Within the rich regional cultures encompassed by the Yellow River basin, reverence for virtue and inclination towards goodness constitute significant hallmarks unifying the moral spirit of Yellow River culture, concurrently symbolizing the universal application of virtue in Chinese civilization[10]. The moral outlook of "reverence for virtue, inclination towards goodness, and the cultivation of respect" inherently harmonizes traditional moral culture with the moral demands of the new era, fitting seamlessly within the contemporary development of Yellow River culture.

3.5 Civilizational Outlook: Mutual Recognition, Coexistence, and Harmony as the Foundation

The Yellow River culture, akin to other great river cultures worldwide, is an open watershed culture. The openness of river cultures stems from their function as vital transportation corridors that facilitate cultural exchanges. As major rivers empty into the sea, they provide favorable conditions for expanding the interaction of riverine cultures, propelling river civilizations into the historical tide of mutual recognition with other civilizations. As human activities and interaction expand, individuals not only recognize their own cultural identities within the community but also establish cognitive frameworks for external cultures, gradually forming a civilizational outlook that balances internal and external perspectives.

The intermingling of the Yellow River and Yangtze River cultures has laid the cultural foundation of Chinese civilization and fostered a civilizational outlook of mutual recognition and coexistence in encounters with other civilizations, serving as an endogenous driving force for its continuous development. Regarding the coexistence of diverse civilizations, the Confucian principle of "harmony as the most precious" emerges as a crucial value, with "harmony" embodying the developmental wisdom of Chinese civilization. Its profound implications, as the essence of Chinese culture, play a pivotal role in supporting and guiding the symbiotic development of global civilizations within the framework of a shared human destiny, becoming a hallmark of the resonant era of coexistence between Yellow River and Yangtze River civilizations.

4 SPATIAL FIELD AND SCENE CONSTRUCTION FOR THE AESTHETIC NARRATION OF YELLOW RIVER CULTURE

As a representative cultural symbol of the Chinese nation, the Yellow River culture's narrative subject is the Chinese nation itself, fundamentally structured by diversity in unity. In the new era, protecting, inheriting, and promoting the Yellow River culture essentially amounts to telling China's story through its lens, showcasing the historical confidence in the continuous development of Chinese civilization and the new chapter of civilization in comprehensively advancing national rejuvenation through Chinese-style modernization.

The construction of the Yellow River National Cultural Park involves creating a systematic narrative logic and specific scenes within designated spatial fields, thereby stimulating the narrative participation and creativity of cultural subjects[11]. This endeavor aims to manifest the inherent value of Yellow River culture within the striving history of the Chinese nation and the civilizational forms created by the times, continuously enhancing people's value recognition, aesthetic experience, and spiritual enlightenment.

4.1 Principles for Spatial Construction of Aesthetic Narration of Yellow River Culture

The Yellow River culture boasts a long history, a vibrant cultural lineage, and an abundance of cultural relics and intangible cultural heritage. Its relentless march through time has painted vivid humanistic landscapes, integrating cultural creativity into the tide of socialist construction with Chinese characteristics. The rich historical and contemporary connotations of Yellow River culture provide ample content resources and scene conditions for its narrative expression, rendering its narrative diverse and colorful.

Protection as the Prerequisite: Implement nationwide protection of Yellow River cultural relics and the ecological environment. Protect intangible cultural heritage through inheritors, establishing working mechanisms including

protection lists, evaluation standards, and responsibility systems. Prioritize the authenticity of Yellow River cultural heritage and the ecological integrity of its natural environment in the construction of cultural dual-narrative spaces, showcasing the unique charm of a green and humanistic space.

Restoration as the Focus: Strengthen water quality and riparian vegetation restoration in the Yellow River basin, maintaining a natural ecological balance. Repair cultural heritage sites with meticulous craftsmanship, highlighting the co-creative life space of Yellow River culture's dual-narrative within the fundamental dimension of harmonious coexistence between humans and nature.

Expansion as the Direction: Provide field conditions for the creative transformation and innovative development of Chinese excellent traditional culture. Through digital empowerment of new cultural production and consumption fields, transform Yellow River cultural narratives from static expressions to dynamic practices, becoming a digital and intelligent space for people to participate in cultural construction in the new era.

Interaction as the Goal: Engage people in narrative scenes, integrating them into the narrative process. Through cultural narrative experiences, stimulate ideological resonance, making Yellow River culture a value carrier for people to co-create a new era's spiritual essence within the cultural community. Additionally, transform the narrative space of Yellow River culture into an exchange and dialogue space between Chinese and world civilizations.

4.2 Dimensions of the Narrative Space Field of Yellow River Culture

Based on the above analysis, we can clearly grasp the distinctive positioning of the narrative space construction of Yellow River culture: green humanistic space, co-creative life space, digital intelligent space, and exchange and mutual recognition space. These provide a basic framework for the field and scene of Yellow River cultural space.

The temporal axis of cultural narrative constructs a sense of history in specific spaces, enabling people to generate cultural emotions through their individual perceptions, connecting members of the cultural community through shared roots and veins. On this basis, the cultural narrative space embodies people's concrete understanding of technological and social development. Its field is open, dynamic, and extensible to multiple subjects, capable of being in a state of self-growth within a certain culture. As an open cultural growth space, the narrative space field of Yellow River culture needs to provide content elements for self-spiritual production for various subjects entering the field, promoting meaning generation based on individual cultural concepts and emotions.

The narrative space field of Yellow River culture can construct its content elements from three dimensions: identity, knowledge, and cognition, creating cultural aesthetics and sentiment satisfaction for people with wisdom as the foundation and emotion as the link.

Highlight Cultural Identity and Showcase Experiential Charm: Emphasize the immersive experience of the cultural landscape within the field, endowing the narrative field of Yellow River culture with distinctive identities. Enable people to actively integrate with cultural identities within the field, projecting their emotions into the overall context of cultural narratives, making each individual the protagonist of the narrative.

Enrich Historical Knowledge and Reveal Development Laws: Focus on constructing cultural lineages with a correct historical perspective, using culture to convey truth and truth to promote culture. Place the rich scenes of Yellow River culture within the grand historical process of the evolution of Chinese civilization, revealing the objective laws of social development and the unyielding cultural character of the Chinese nation.

Enhance Civilizational Understanding and Inspire Practical Creation: Emphasize the exchange and fusion between Yellow River culture and other cultures. Highlight the essential requirements and global significance of mutual recognition among civilizations through the openness of the Yellow River cultural field. With the inclusive pattern of Chinese civilization, inspire innovative momentum and development paths for civilizational practices, promoting the construction of a community with a shared future for mankind.

4.3 Basic Scenes of the Yellow River National Cultural Park

The National Cultural Park is a nationally significant cultural narrative space with important cultural landmark significance, carrying the core function of national cultural narrative. It not only showcases the connotation and essence of national culture but also further promotes the overall transformation and practical innovation of cultural resources, enduringly presenting the charm of national culture to the world through specific scenes and activities.

As a major project for cultural prosperity and development in the new era, the Yellow River National Cultural Park is a spatial field that centrally showcases the protection, inheritance, and promotion of Yellow River culture. It integrates important sections along the river basin into a complete narrative system of Yellow River culture. Based on the natural watershed culture of major rivers, the Yellow River's mainstream exhibits different hydrological characteristics and representative scenes in its upper, middle, and lower reaches, providing rich narrative content for the Yellow River National Cultural Park.

Based on the key construction strategies of the National Cultural Park, its main functional areas cover four aspects: control and protection, thematic display, cultural tourism integration, and traditional utilization. Its basic scenes can be refined into six components: archaeological sites, natural shorelines, thematic venues, sightseeing and leisure, cultural research and creation, and ceremonial activities. By regularly hosting ceremonial activities related to Yellow River culture, such as sacrifices, celebrations, and cultural festivals, abstract cultural values can be concretized into

perceivable and experiential forms, enabling people to deeply appreciate the unique charm and profound significance of Yellow River culture through participation.

5 AESTHETIC STRATEGIES FOR DISSEMINATING CHINA'S NATIONAL IMAGE THROUGH YELLOW RIVER CULTURE

Yellow River culture serves as a distinctive hallmark of Chinese culture, providing essential content for national cultural narratives and offering direct support for telling China's stories well. Utilizing Yellow River culture to narrate China's stories not only reinforces cultural and historical confidence in China, fully showcasing the enduring influence and internal cohesion of traditional Chinese culture; it also caters to the need of developing socialist advanced culture in the new era, continuously enhancing the transmission of Chinese civilization and the creativity of modern civilization, as well as shaping and disseminating the image of a socialist cultural power[12]. It plays a pivotal role in fostering mutual understanding among people worldwide, deepening exchanges and mutual recognition of world civilizations, and promoting Chinese culture's better integration into the global arena through cultural charm and value cognition.

Based on the construction of the Yellow River National Cultural Park, we should focus on narrative expressions centered on Yellow River cultural resources. By employing Yellow River culture to present and disseminate a credible, lovable, and admirable image of China, we can, on the basis of enhancing the intuitive experience of reading materials and scenic views, guide people's reflections and innovations on life, forming a national image communication system that bridges the historical and contemporary eras. It is crucial to employ fundamental, crucial, implicit, and leading strategies in cultural dissemination.

5.1 Let "Cultural Relics" Speak

Cultural relics are material remnants left over from the development of human society and civilization, embodying specific values. They reflect material creations and aesthetic expressions based on people's production and life in particular historical periods, condensing certain values, spiritual aspirations, and societal development pursuits.

As the core region of the origin and development of Chinese civilization, the Yellow River basin is rich in cultural relics. Nationally protected cultural relics units are clustered along the river, exhibiting a centralized structural feature in terms of type distribution, with ancient architecture dominating in quantity. In the national cultural narrative system, cultural relics serve as the most direct carriers and cultural tokens that directly touch people's hearts in the dissemination of national images[13]. Therefore, fully utilizing cultural relics to disseminate national cultural images has become a fundamental strategy.

5.2 Delight in "Beauty"

As a world-class river basin culture, Yellow River culture encompasses natural landscapes and artificial structures, both of which constitute cultural aesthetic objects. Meanwhile, poetic and prose compositions, as the mainstay of aesthetic activities, create and reproduce the artistic conception of cultural aesthetics through spiritual construction, injecting a living soul into cultural dissemination. The charm of Yellow River culture lies in the inherent organic unity of natural beauty and humanistic beauty. How to enable people to appreciate its cultural essence through their perception and creation of beauty is a crucial strategy for expanding the effectiveness of national cultural image dissemination.

The primary prerequisite for the ecological beauty of Yellow River culture is the protection of water bodies and riparian vegetation, restoring vitality to the cradle of the Yellow River and presenting a beautiful picture of harmonious coexistence between humans and nature. This can be achieved by establishing nature reserves at various levels, improving the aquatic ecological environment, and conserving the biological resources of the Yellow River. Additionally, corresponding ecological protection organizations should be established to encourage more people to actively participate in the protection of Yellow River biological resources, thereby making ecological protection the foundation of Yellow River culture and the highlight of its beautiful landscapes.

Addressing and coordinating the natural ecological protection of the Yellow River with modern production organizations is crucial for constructing an aesthetically pleasing Yellow River landscape system. As an economic artery, the Yellow River itself carries significant production and transportation functions. Promoting its green production transformation is an essential aspect of showcasing the beauty of modern development in Yellow River culture.

Simultaneously, guiding people to advocate and adopt green lifestyles is also the intrinsic value of Yellow River culture for individuals. Its cultural beauty should also be embodied through people's social behaviors. Presenting the beauty of Yellow River culture in the narrative expression and dissemination of national images not only allows people to intuitively appreciate the natural scenery of the Yellow River but also integrates the concept of ecological protection into people's lives and production, making "beauty" delightful through people's green behaviors and continuously creating new connotations of the times.

5.3 Let "Wisdom" Shine

Using Yellow River culture as an expression of national narratives, in the process of disseminating national images, apart from employing explicit strategies such as cultural relic narratives, landscape narratives, and subject behavior

narratives that directly affect people's sensory systems, it is also essential to integrate the ideological wisdom of the diverse yet unified continuous development of Chinese civilization into the entire narrative process. This involves telling China's stories well with values and cultural logic, and effectively utilizing implicit strategies in narrative frameworks for image dissemination. The narrative framework and the narrative itself form an interactive and mutually supportive unity, rooted in the basic cultural stance and historical perspective established by the narrative subject, as well as the logical development centered on the relevant content itself, reflecting the fundamental relationship constructed between the subject's cultural self-recognition and that of others.

The millennial cultural heritage of Yellow River culture not only resonates with the cultural values of people in vast river basins and their profound recognition of cultural community unity, embedding the unique temperament of Yellow River culture within rich cultural forms but also deeply ingrains the value genes of Chinese culture and the iconic concepts of Chinese civilization, making it a representative narrative of Chinese culture.

Therefore, the narrative framework of Yellow River culture should not be limited to its origin and evolution but should instead take a broad view of the overall development pattern and context of Chinese culture. Within the overarching narrative of the origin and evolution of world river civilizations, a logical thread should be constructed that connects the Yellow River culture with Chinese culture as sharing the same roots and the mutual recognition and communication between Chinese civilization and world civilizations.

Yellow River culture embodies the ideological wisdom of the continuous development of Chinese civilization. How to make Chinese wisdom shine with global influence is a focal point that requires special attention in cultural narrative dissemination, playing a vital role in deepening the perception of national images. This dissemination focus is naturally recognized through the narrative structure of Yellow River culture rather than being deliberately crafted outside the basic narrative system. Let the light of wisdom shine alongside cultural narratives, becoming the essence and realm of shaping and disseminating national images through culture.

5.4 Aspire for the "Future"

Yellow River culture, with its long history and profound accumulation, serves as an important spiritual bond that maintains the diversity and unity of the Chinese nation. During its long-term evolution of openness, exchange, and integration, it possesses robust cultural vitality, forming a continuous development pattern of Chinese culture spanning thousands of years. The vitality of Yellow River culture essentially embodies the continuous cultural creation of cultural subjects. A nation's cultural creativity is the fundamental force shaping its national spiritual cohesion and determines its cultural vitality.

Telling China's stories through Yellow River culture should not only focus on the unique resources of traditional Chinese culture it embodies, fully showcasing cultural genes and modern inheritance, reinforcing the historical identity of Chinese culture, but also aim at the continuous creation of cultural subjects, highlighting the development trajectory and era characteristics of socialist advanced culture, forming a modern identity for Chinese culture, and enhancing the charisma of the national cultural image in contemporary times.

Inspiring people's aspirations for the "future" development of Yellow River culture and emphasizing the "creativity" of Chinese culture, showcasing its endless vitality and rapid changes to the world, constitute leading strategies for the dissemination of national cultural images. The key to the leading role of this cultural image in dissemination lies in guiding people to experience its cultural creativity's value attraction and aesthetic orientation through rich cultural experiences, as well as its potential to create an even better future, resonating with people's ideal lives and cultural expectations.

6 CONCLUSION

The protection, inheritance, and promotion of the Yellow River culture in the new era form an interconnected cultural value chain, with protection as the premise, inheritance as the foundation, and promotion as the key. Preservation and inheritance serve to facilitate contemporary creativity, ensuring that the fruits of cultural development continuously meet the modern spiritual needs of the people. It is imperative to demonstrate the contemporary creativity of the Yellow River culture through the practice of building a culturally strong nation with Chinese characteristics, showcasing the nation's cultural creativity through an ever-growing array of cultural products and continually expanding its global influence. In this sense, cultural creation inherently constitutes the building blocks of communicative power and effectively shapes an alluring image that inspires aspirations.

By leveraging the Yellow River culture to narrate China's stories, we not only emphasize the unique resources embedded within the fine traditional Chinese culture, fully showcasing its cultural genes and modern inheritance, reinforcing the historical identity of Chinese culture, but also focus on the sustained creativity of cultural entities. This involves highlighting the developmental trajectory and contemporary characteristics of socialist advanced culture, forming a modern identity for Chinese culture and enhancing the appeal of the national cultural image in the contemporary era.

Instilling a yearning for the "future" of the Yellow River culture involves emphasizing the "creativity" of Chinese culture, showcasing its enduring vitality and rapid evolution to the world. This constitutes a leading strategy in the dissemination of the national cultural image. The crux of this leading role lies in guiding people to experience the value

attraction and aesthetic orientation of cultural creativity through rich cultural experiences, resonating with their aspirations for an ideal life and cultural expectations.

In conclusion, the holistic approach to protecting, inheriting, and promoting the Yellow River culture necessitates a deep understanding of its historical significance, contemporary relevance, and future potential. By embracing its unique cultural heritage and fostering innovation, we can harness the Yellow River culture as a powerful narrative tool to tell China's stories, strengthen national cultural identity, and enhance global cultural influence. The key lies in striking a balance between preserving the essence of tradition and fostering creativity, ensuring that the Yellow River culture remains vibrant, relevant, and inspiring for generations to come.

Moreover, the promotion of the Yellow River culture should be integrated into broader national development strategies, fostering cultural tourism, creative industries, and international cultural exchanges. These efforts will not only enrich people's lives and promote social harmony but also contribute to the construction of a harmonious world through cultural dialogue and mutual understanding.

Ultimately, the Yellow River culture represents a treasure trove of wisdom, values, and aesthetics that have shaped China's past, present, and future. By nurturing its creative potential and sharing its rich heritage with the world, we can contribute to the common prosperity of human civilization and foster a more interconnected and harmonious global community.

COMPETING INTERESTS

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CHALLENGES AND SOLUTIONS FOR REAL ESTATE MARKETING IN THE DIGITAL ERA

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Abstract: With the advent of the digital age, real estate marketing has undergone unprecedented changes. Compared to five years ago, the real estate market is facing numerous realities such as a decline in purchasing power and purchasing willingness. The enormous inventory and low sales volume have put significant pressure on the real estate industry. This study aims to explore the main challenges faced by real estate marketing in the context of digitalization and possible paths to address these challenges. The research first analyzes the current digital trends in real estate marketing, then discusses in detail the main challenges, including technological challenges, market competition, and changes in customer demand. It also proposes a series of targeted solutions, such as technological innovation, market segmentation, and brand building.

Keywords: Digitalization; Real estate; Marketing

1 INTRODUCTION

Data shows that in 2023, the national real estate development investment was 11,091.3 billion yuan, a decrease of 9.6% compared to the previous year. The sales area of commercial housing was 1,117.35 million square meters, a decrease of 8.5% compared to the previous year. The sales amount of commercial housing was 11,662.2 billion yuan, a decrease of 6.5% compared to the previous year. On one hand, the decline in real estate investment and sales indicators has narrowed, with many real estate companies facing financial operation difficulties and challenges in real estate sales. On the other hand, the national “guaranteed delivery of buildings” work is progressing steadily, and the completion area of real estate has increased rapidly. These realities demand unprecedented efforts and actions from the sales side of the real estate industry to accelerate the circulation of funds and products in the real estate sector. At this moment, marketing models, marketing methods, and marketing techniques are particularly important.

The risks associated with the construction and marketing of real estate projects are primarily concentrated in several key areas, including policy risks, regional development risks, natural risks, financial risks, and market competition decision-making risks[1]. For the real estate industry and companies, how to adapt to the changing times, effectively utilize internet technology, and accurately grasp user needs is crucial to successfully making this “perilous leap,” achieving increased company profits, and ensuring a “smooth landing.” With the rapid development of internet and mobile communication technologies, the industry is undergoing a transformation from traditional marketing to digital marketing. This transformation not only changes the way real estate companies interact with customers but also poses new challenges to marketing strategies and business models. This study aims to analyze these challenges and explore new paths for real estate marketing in the context of the digital era.

2 CURRENT TRENDS IN DIGITAL MARKETING FOR REAL ESTATE

There are several significant trends in the current real estate industry worth noting. First, the shift from rapid development to high-quality development; second, the transition from an incremental market to a stock market; third, the change from pre-sale of off-plan properties to the sale of completed properties; and fourth, the separation of commercial housing from affordable housing. Only by fully understanding the current situation and future trends of the real estate industry can reasonable marketing models, methods, and strategies be formulated. It is particularly important to emphasize that future marketing efforts must focus on protecting privacy and eliminating false advertising[2].

2.1 Extensive Application of Digital Tools

With the rapid advancement of technology, the application of digital tools in real estate marketing has become increasingly widespread and in-depth. Unlike traditional real estate marketing, which focused more on offline strategies, digital real estate marketing is characterized by its technicality, convenience, and communicability. By leveraging new channels such as search engines and social media, real estate companies can more accurately target potential customers and conduct targeted promotional campaigns[3]. This not only allows a broader audience to gain a clearer understanding of the real estate company’s products but also enables customers to convey their actual needs to the real estate companies[4]. These digital tools are primarily used in three scenarios:

Social Media Marketing: Real estate companies are increasingly using social media platforms (such as Weibo, WeChat, and TikTok) for brand promotion and customer interaction. Through these platforms, companies can directly communicate with potential customers, release property information, share market trends, and even conduct direct sales.

Big Data Analysis: Big data technology enables real estate companies to collect and analyze large amounts of market and customer data. This data helps companies identify market trends, predict demand, and formulate more precise and effective marketing strategies.

Virtual Reality (VR) Technology: The application of VR technology in real estate marketing is becoming increasingly popular. Through virtual reality, potential buyers can tour remote properties without leaving their homes, which not only enhances the customer experience but also significantly saves time and costs.

2.2 Changes in Customer Behavior

We should recognize that in the context of digitalization, consumer behavior in home buying is also undergoing significant changes. The advent of online media has transformed customers from passive recipients into active participants[5]. Firstly, the channels for obtaining information have diversified. With the widespread use of the internet, consumers increasingly rely on online information during their home-buying decision process. They obtain property listings, prices, area analyses, and user reviews through various online platforms. Secondly, there is a high reliance on online reviews and community opinions. Online reviews and word-of-mouth on social media have an increasing influence on consumers. Many potential buyers refer to other buyers' reviews and experiences before making a purchase decision. Lastly, there is increased interaction and engagement. Consumers in the digital age are more willing to interact with brands. They expect to communicate with sales representatives in real-time through online channels, receiving instant feedback and support.

2.3 Changes in Market Competition Landscape

The continuous development of digitalization not only profoundly drives social change but also makes the real estate market more competitive and flat. Besides the product itself, key factors in real estate sales increasingly rely on information technology and connectivity. Digitalization brings an equal competitive environment, providing small real estate developers with an opportunity to compete with large enterprises. Small companies can achieve broad market coverage within a limited budget by effectively utilizing digital marketing tools. Digitalization increases market transparency, making it easier for consumers to compare the prices and quality of different properties, which forces real estate companies to enhance their competitiveness. Digitalization demands higher requirements for content innovation and product innovation. Whether it is marketing strategies, technological applications, or service models, innovation is a crucial factor in winning the market.

3 ANALYSIS OF CHALLENGES

3.1 Technical Challenges

The rapid technological advancements in the digital age, especially in the field of real estate marketing, present significant challenges. One such challenge is the fast-evolving technological environment. For example, the introduction of Virtual Reality (VR) and Augmented Reality (AR) technologies has revolutionized property showcasing and customer experience. However, the rapid development of these technologies also means that companies need to continuously learn and adapt to new tools, while investing substantial funds in technological upgrades and maintenance. For many real estate companies, particularly small and medium-sized enterprises, this is both a financial burden and a challenge in terms of knowledge and skills. Additionally, the high cost of technology investment is a major obstacle to digital marketing in real estate. For instance, establishing a comprehensive big data analytics platform requires not only the purchase of expensive software and hardware but also the hiring of data analysts, IT experts, and other professionals. This can be an unaffordable burden for small and medium-sized enterprises with limited funds. Moreover, the efficient implementation of digital marketing relies on professional talents such as data analysts and digital marketing experts. However, these talents are scarce resources in the market, and the costs of recruitment and training are high. Furthermore, since the real estate industry traditionally has had less demand for such talents, many companies face challenges in attracting and retaining these professionals.

3.2 Intensified Market Competition

The widespread adoption of digitalization has lowered the barriers to market entry, enabling more entrepreneurs and companies to enter the real estate market. This competition comes not only from traditional real estate companies but also from various emerging internet real estate companies. These new players are often more flexible and more familiar with digital marketing, which may give them a competitive edge in certain aspects. In an increasingly transparent market, consumers can easily access and compare the prices and quality of different properties. This has led to price wars, especially in areas where supply exceeds demand. To attract customers, some developers may be forced to lower prices, putting pressure on profit margins. In a highly competitive market, establishing a distinctive and attractive brand image becomes increasingly difficult. With more choices available to consumers, their brand loyalty decreases. Real estate companies need to continuously innovate and update their marketing strategies to maintain brand appeal and market share.

3.3 Diversification of Customer Needs

Modern consumers' demands for real estate have become increasingly personalized and segmented. They not only focus on basic living needs but also care about the property's location, community environment, design style, and supporting facilities. For example, some customers may prefer eco-friendly and energy-efficient homes, while others might be more interested in smart home systems. This personalization of needs drives real estate companies to conduct more detailed market segmentation and offer a more diverse range of products and services. In the digital age, consumers can easily access a vast amount of information through the internet. Therefore, they have higher requirements for the quality and reliability of information. This means that real estate marketing must not only provide attractive content but also ensure the accuracy and timeliness of the information. Errors or outdated information can quickly lead to a loss of consumer trust.

4 PATH EXPLORATION

4.1 Technical Assurance

Technical assurance is the cornerstone of digital real estate marketing. It involves how real estate companies address technical challenges and ensure a smooth digital transformation.

4.1.1 Continuous investment and upgrading of technology

In the digital era, rapid technological evolution and innovation are inevitable. Real estate companies need to continuously invest in and upgrade their technological infrastructure to keep pace with these changes. Virtual Reality (VR) technology is a notable example. Through virtual home tours, customers can explore properties in a virtual environment, which not only enhances customer engagement but also reduces the number of physical visits, thereby lowering costs. Big data analytics tools can help companies better understand market trends and customer preferences, aiding in making more intelligent strategic decisions. Although these investments may incur initial costs, in the long run, they will help companies improve efficiency, reduce unnecessary expenses, and provide higher quality customer experiences.

Another important aspect is data security. As technology advances, the risks of data breaches and cyber-attacks also increase. Therefore, real estate companies need to continuously upgrade their data security measures to ensure that customers' sensitive information is not stolen or leaked. This includes investing in the latest data encryption technologies, security auditing tools, and threat detection systems.

4.1.2 Establishing technology partnerships

Establishing partnerships with technology suppliers is a wise strategy, especially for small and medium-sized real estate companies that cannot afford high costs of technology development and research. Technology suppliers usually possess expertise and experience, providing mature solutions that alleviate financial pressure on companies. Additionally, these partnerships can help companies gain access to new technologies and market information more quickly. For example, partnerships can enable companies to rapidly adopt the latest virtual reality technologies or big data analysis tools without having to develop them from scratch. Establishing technology partnerships also helps companies maintain a competitive edge in the digital realm. By collaborating with leading technology companies, businesses can stay abreast of technological innovations, offering more advanced products and services. This helps attract more customers and increase market share.

4.1.3 Talent development and recruitment

Having high-quality digital talent is crucial for real estate companies. As technology continues to advance, companies need internal teams with digital skills to fully leverage new technologies to serve customers. Firstly, internal training: companies can enhance employees' digital skills through internal training programs. This includes workshops, seminars, and training courses to help employees understand and master new technologies. Training can cover key technological areas such as virtual reality, big data analysis, and blockchain. Secondly, external recruitment: companies can also hire professionals with technical backgrounds. These experts may have deep technical knowledge and experience, enabling them to quickly address technological challenges. Recruiting experts in the digital field will help improve the company's digital capabilities. Thirdly, digital awareness training: besides technical skills, enhancing the team's digital awareness is also crucial. Employees should understand the importance of digital transformation and how new technologies impact their work. This can be achieved through training, internal communication, and building a digital culture.

In summary, technological support is key to the success of digital real estate marketing. Continuous investment and upgrades in technology, establishing technology partnerships, and talent development and recruitment are essential steps to ensure companies can fully utilize new technologies, improve efficiency, and enhance customer experience. This will help companies maintain a competitive edge in the digital era, meet customer needs, and achieve success.

4.2 Enhancing Market Competitiveness

Enhancing market competitiveness means that real estate companies need to stand out in a highly competitive market, attract more customers, and maintain a stable market position.

4.2.1 Brand differentiation

In a highly competitive real estate market, brand differentiation is crucial. Companies need to create a unique brand

image to attract customers and build trust.

Personalized Design Services through Digitalization: Different customers have different needs and tastes, so offering customized design options is a strong selling point. This can include interior decoration, color choices, and custom furniture to meet the unique needs of customers.

Unique Service Concepts: Companies can develop unique service concepts, such as providing customer service that exceeds expectations and offering 24-hour online support. This concept can be highlighted in the brand, establishing a positive image in the minds of customers.

Focus on Social Responsibility: Participating actively in community activities and supporting charitable causes can also differentiate a brand. This helps to build a good social image among customers.

4.2.2 Precision marketing

Precision marketing involves understanding customers in depth and formulating targeted marketing strategies to improve conversion rates and reduce marketing costs.

Utilizing Big Data: By analyzing customer behavior and preferences, companies can gain deep insights into their needs. This includes analyzing customers' search history, purchasing behavior, interests, etc. Such customer insights help companies better understand what type of property customers are looking for.

Personalized Marketing Strategies: Based on customer insights, companies can develop personalized marketing strategies. This includes customizing advertising content, choosing appropriate marketing channels, and providing relevant information to customers at the right time. Such customized strategies can increase ad click-through rates and conversion rates.

Optimizing Marketing Strategies: By analyzing the effectiveness of marketing activities, companies can optimize their marketing strategies. This includes tracking the ROI (Return on Investment) of ad placements, analyzing conversion rates, and monitoring customer feedback. By continuously adjusting and improving strategies, companies can enhance the effectiveness of their precision marketing.

4.2.3 Strengthening customer relationship management

Establishing good customer relationships is key to successful real estate marketing. Using a Customer Relationship Management (CRM) system can better manage customer information, track customer activities, and provide personalized services.

Maintaining Contact with Customers: A CRM system can help companies stay in touch with customers, respond to their needs promptly, and provide customized suggestions.

Regular Communication: Regular communication with customers is crucial for maintaining good relationships. This includes sending regular updates, new property information, market trend analysis, etc. Through regular communication, companies can keep customers interested and provide valuable information.

Collecting Customer Feedback: Companies should actively collect customer feedback to understand their satisfaction and needs. This can be achieved through surveys, online reviews, customer feedback meetings, etc. Feedback helps companies better meet customer expectations and improve their services.

4.3 Market Segmentation

Market segmentation is a key strategy that enables real estate companies to better meet the needs of different customer groups. By gaining a deep understanding of various market segments, companies can carry out more targeted marketing activities and provide tailored services. The following is a detailed analysis of market segmentation strategies and methods:

4.3.1 Customer profile analysis

Customer profile analysis serves as the foundation for market segmentation. By understanding the needs, preferences, and characteristics of different customer groups, companies can better meet their expectations. For example, young professionals may prioritize urban living and convenience, while families might focus more on school districts and community amenities. Therefore, businesses can develop specific products and marketing strategies based on customer profiles to cater to the needs of various groups.

4.3.2 Customized products and services

Market segmentation not only involves understanding customer needs but also developing customized products and services for different segments. For example, housing designed for seniors may need to consider accessibility features and social activities, while housing for young families may require more child-friendly amenities. By offering products and services that meet the specific needs of market segments, companies can improve customer satisfaction and increase market share.

4.3.3 Market segmentation

Market segmentation also applies to marketing strategies. By precisely targeting specific market segments with advertising and marketing campaigns, companies can improve the effectiveness and conversion rates of their ads. For instance, for customers looking for vacation homes, companies can place ads near vacation destinations, while for those seeking long-term residences, more information about schools and communities can be provided. This personalized advertising strategy helps attract specific types of customers and enhances the return on investment in advertising.

5 CONCLUSION

The digital age has brought unprecedented opportunities and challenges to real estate marketing. Under the new circumstances, China's real estate marketing system still needs further improvement. Many real estate marketing strategies lack a certain degree of specificity and effectiveness, directly affecting the sustainable and healthy development of the real estate industry[6]. For the real estate industry, three main points were highlighted: First, it is necessary to actively and prudently resolve real estate risks, aligning with a series of policy measures that the government has successively introduced, such as the "no mortgage recognition for first-time homebuyers," "reducing down payment ratios and interest rates," and "supporting financial institutions in meeting the reasonable financing needs of real estate companies." Second, it is important to support the three key national projects, which include the construction of affordable housing, the development of "dual-use" public infrastructure for both regular and emergency situations, and the renovation of urban villages. Third, the industry needs to accelerate the construction of a new development model for real estate, actively exploring marketing strategies under the backdrop of digitalization to address development challenges and promote stable and healthy growth in the real estate market. The advancement of digitalization imposes higher demands on the development of the real estate industry, profoundly transforming business models and the competitive landscape. Therefore, real estate companies must actively understand and adapt to these changes. By employing strategies such as technological assurance, innovation, market segmentation, and enhancing competitiveness, they can better respond to these challenges, achieve sustainable growth, and stand out in today's digital era.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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RESEARCH ON TEACHING STRATEGIES OF ANCIENT GREEK MYTHOLOGY BASED ON PBL PROBLEM-BASED LEARNING METHOD

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Abstract: Problem-Based Learning (PBL) is widely endorsed as an instructional strategy across various academic arenas, tailored to foster critical thinking and problem-solving skills among students. This paper scrutinizes both the merits and limitations of incorporating PBL into ancient Greek mythology pedagogy at the tertiary education level. The investigation is grounded in a pragmatic outlook, considering the practical challenges and successes experienced both by educators and students. We delve into the philosophical rationale and instructional particularities of PBL, tailoring its application to the distinctive content of ancient Greek mythology. The paper presents the potential for a robust learning experience that intertwines the richness of mythological narratives with the dynamic student-centric inquiry emphasized by PBL. The research advocates for a conscientious integration of PBL in the teaching of ancient Greek mythology, upholding the integrity of its student-driven, exploratory ethos amidst diverse educational settings. Acknowledging the fiscal and ideological support required for optimal deployment, the treatise offers insights into the symbiotic relationship between the narrative complexity of mythology and the inquiry-based approach of PBL. The observations suggest that, although the ideals of PBL align with an immersive understanding of ancient texts, the applied methodologies often diverge from theoretical purism, thus forming an educational conundrum similar to the enigmatic puzzles of the myths themselves.

Keywords: Ancient Greek mythology; PBL problem-based learning method; Teaching strategies

1 INTRODUCTION TO PROBLEM-BASED LEARNING (PBL) AND ANCIENT GREEK MYTHOLOGY EDUCATION

Problem-Based Learning (PBL), as an educational pedagogy, emphasizes student engagement through the confrontation and resolution of real-world problems, stimulating higher-order cognitive functions such as critical thinking and problem-solving. Originating in medical education and progressively permeating various disciplines, PBL forges a learning environment where traditional teacher-centered lectures abate in favor of student-driven exploration. Within the parameters of this educational innovation, learners grapple with complex, iterative problems that enhance their inquiry skills and consolidate their knowledge base through interdisciplinary integration.

Ancient Greek mythology, with its vast array of narratives, characters, and philosophical themes, offers a vibrant repository of content for tertiary education. Serving as a cornerstone for Western civilization, it profoundly influences modern thought, art, literature, and psychology. The reverence for these ancient narratives extends beyond their cultural importance; they permit a multi-faceted exploration of humanity's ancestral roots and the complex fabric of human ethos and ethics.

In recognizing the interdisciplinary and multifarious nature of Greek mythology, PBL proponents have postulated the integration of this method in its pedagogy. This entails designing curriculum modules around central mythological problems or themes, prompting students to navigate the intricate mythic lore while employing research methodologies mirroring the investigative processes of scholars.

The present study posits a dual aim: to critically evaluate the theory and application of PBL in the context of ancient Greek mythology education and to explore the potential enhancements in student learning outcomes through this instructional synergy. In doing so, it grounds its discourse in an empirical framework that encompasses extant literature while anticipating uncharted educational territories that may unfurl through this interdisciplinary approach.

The scope of this study encompasses educational theory, the genesis and development of PBL, its efficacy and challenges, and the unique attributes of ancient Greek mythology that render it both a challenging and a fitting subject for PBL's robust educational strategies. Through this investigation, we endeavor to illuminate the path for an enriched academic experience that bridges the chronological gap between antiquity and contemporary scholarship, fostering an inter-temporal dialogue facilitated by the PBL method.

1.1 Conceptual Framework of PBL

Problem-Based Learning (PBL) is an educational approach that emphasizes student-centered, inquiry-based learning whereby students learn about a subject through the experience of problem solving. The framework of PBL violates

traditional pedagogical techniques by focusing less on direct instruction and more on collaborative problem-solving tasks where the learning occurs during the process of working toward a solution [1]. According to Hmelo-Silver, PBL places the student in an active role where they are encouraged to explore problems with a multilayered structure, lending themselves to multiple solutions or requiring the integration of various information sources [2].

In an authentic PBL setting, the problem precedes the learning, that is, knowledge acquisition arises out of the need to understand and solve a problem rather than approaching learning as an accumulation of factual knowledge to be later applied to problem situations [3]. This often leads to deeper understanding and retention of knowledge because information is acquired contextually and through active engagement [4].

The architectural design of PBL involves presenting students with a complex, real-world problem that lacks a clear solution [5]. This requires the students to firstly acknowledge their own knowledge gaps, followed by a pursuit of new knowledge through research and collaboration. Within this framework, the role of the instructor shifts from being the source of knowledge to being a facilitator or guide who supports students in their learning process, challenging assumptions, and guiding the discussion without dictating its course [6].

An intrinsic aspect of this learning method is reflective practice; students are expected to not only find solutions but also reflect on their learning strategies and group dynamics. This reflection is critical as it enables learners to assimilate what was effective as well as identify areas in need of improvement, hence promoting self-directed learning skills [7].

To conclude, the conceptual framework of PBL is defined by its problem-first strategy, a student-driven discovery process, facilitator-guided inquiry, collaborative learning experiences, and iterative reflection on both the process and the outcome. It is a comprehensive educational approach that mirrors the complexity of real-life situations while fostering a deep and transferable skill set in learners.

1.2 Significance of Ancient Greek Mythology in Tertiary Education

The instruction of ancient Greek mythology within tertiary education serves as a pivotal channel for imparting a diverse range of educational benefits that extend beyond the mere acquisition of cultural knowledge. Ancient Greek myths, by virtue of their narrative complexity and inherent exploration of human nature, morality, and society, offer a fertile ground for critical thought and reflective analysis.

Understanding these myths enables students to appreciate the foundational pillars of Western civilization and the far-reaching influences that these stories have exerted on literature, art, philosophy, and psychology. The amalgamation of characters, themes, and symbolic motifs found in mythological narratives provides a rich tapestry for interdisciplinary study, linking areas such as linguistics, history, anthropology, and comparative religion.

The colossal figures and epic tales of Greek mythology play an instrumental role in sharpening interpretive and analytical skills, as students engage with multifaceted stories that contribute to a deeper comprehension of human experiences and universal themes. This educational process is further enhanced by addressing the myths through culturally responsive pedagogies, which allows learners from diverse backgrounds to connect the ancient world to contemporary life and societal issues. Such connections foster critical perspectives and promote empathy by relating the ancient tales to modern ideologies and moral dilemmas.

In the realm of higher education, the wealth of ancient Greek myths facilitates a comprehensive understanding of narrative structures, thereby honing literary and rhetorical competencies that are transferable across various fields of study. The enduring legacy of Greek mythology, seen in the plethora of modern adaptations, validates its ongoing relevance and the importance of its inclusion in a comprehensive curriculum.

In the scope of PBL, the engaging content of ancient Greek mythology offers an expansive base from which problem-driven inquiries can emerge. The multidimensional aspects of ancient Greek stories provide a dynamic backdrop that motivates students to question, explore, and draw parallels between the mythological content and their own experiential realities. This, in turn, guides the development of higher-order thinking skills and the ability to navigate complex information in a systematic and collaborative learning environment.

Ultimately, the significance of ancient Greek mythology in tertiary education is manifold, serving not only as a conduit for understanding past civilizations but also as an essential tool for enriching critical thinking and broadening the horizon of inquiry-based academic discourse.

1.3 Integration of PBL in Teaching Ancient Greek Mythology

The integration of Problem-Based Learning (PBL) into the teaching of Ancient Greek Mythology represents an innovative pedagogical approach, aimed at enhancing the educational experience by fostering a problem-solving mindset among students. This integration leverages the affinity between the complexity of Greek mythology and the inquiry-based nature of PBL, with its emphasis on student-driven exploration and discovery.

In the milieu of tertiary education, where rote learning often prevails, PBL's introduction into Ancient Greek Mythology teaching strategies serves to transcend traditional didactic instruction. By incorporating PBL, educators can facilitate a shift from passive memorization to active engagement, prompting students to unravel the layered meanings within mythological

narratives through critical analysis and collaborative discourse. The resultant learning environment is akin to the investigative domain of Greek mythology itself, replete with enigmas and moral dilemmas that require deep contemplation and creative resolution.

The integrative process involves formulating real-world or abstract problems based on the intricacies of Greek myths, which students then dissect using a multidisciplinary approach. Elements of history, literature, philosophy, and even psychology become intertwined as students navigate through the given problems. Within this framework, students embark on a quest for knowledge, mirroring the quests of mythological heroes, while simultaneously cultivating essential academic and life skills, such as analysis, teamwork, and the ability to articulate and defend one's perspective.

Challenges to the integration of PBL in teaching Ancient Greek Mythology do exist, including the need for careful planning and structuring of PBL scenarios to ensure alignment with curricular goals and the myths' idiosyncrasies. Educators must design problems that encourage students to delve into both the context and the content of Ancient Greek myths, fostering a depth of understanding that can be translated into contemporary reflections on human behavior and cultural phenomena.

The optimal execution of PBL in this field also necessitates an appropriate balance between minimal guidance and sufficient support. As students grapple with mythological problems, the role of the educator is transformed from that of a knowledge dispenser to a facilitator, guiding and challenging students' thought processes as they thread together theoretical insights and practical applications.

In summary, the integration of PBL into the teaching of Ancient Greek Mythology entails the conscious alignment of problem-solving pedagogy with the intricate layers of mythic narratives. It aims to foster an educational narrative that is not only intellectually stimulating but also richly rewarding in terms of personal and academic development. Through PBL, the timeless allure of Greek myths is revitalized, enabling students to interact with legends in a manner that promotes lifelong learning and a nuanced grasp of the human condition.

1.4 Aims and Scope of the Study

The aims and scope of this study are manifold and traverse the interdisciplinary landscape of pedagogy, classical studies, and learning theory. Primarily, this research endeavours to investigate the practicality and effectiveness of the Problem-Based Learning (PBL) approach when applied to the instruction of ancient Greek mythology within higher education settings. The scope includes an examination of how PBL can be tailored to accommodate the mythical narratives and complex thematic structures intrinsic to Greek mythology, considering the learning needs and cognitive development of tertiary students.

A central aim is to discern the impacts and educational outcomes of PBL on students' critical thinking, problem-solving capabilities, and deep comprehension of mythical content. We aspire to uncover how the PBL methodology can enrich the student learning experience by encouraging active engagement with the multifaceted aspects of Greek myths, thereby fostering a dynamic and student-centric learning environment.

This research will also address the facilitators' role in the PBL process, looking into the precision and adaptability with which they must unpack the mythological content. In alignment with the expansive nature of PBL, this investigation will probe into how educators can guide students through a process that is both nuanced and responsive to individual learning journeys while upholding the rigorous standards of scholarship inherent in classical studies.

Furthermore, the scope of the study encompasses the pragmatic challenges educators might confront in integrating PBL into the Greek mythology curriculum—such as resource allocation, curriculum design, and assessment methodologies. The study aspires to contribute to the dialogue surrounding educational reform and innovation, particularly within the humanities, advocating for evidence-based strategies in teaching ancient narratives in a manner that resonates with contemporary pedagogical imperatives.

By mapping the confluence of ancient Greek mythology and PBL, this research will add to the academic discourse by elucidating how narrative complexity and problem-based inquiry can coalesce to form a transformative educational experience. In essence, the study aims to transcend the theoretical exploration of PBL, inspecting its practical applicability and potential optimisation in the realm of classical mythology education.

2 LITERATURE REVIEW

The educational paradigm of Problem-Based Learning (PBL) has been embraced in various disciplines as a transformative approach to foster higher-order thinking skills. Literature extensively advocates for its effectiveness in enhancing critical analysis, self-directed learning, and group collaboration among students [8]. PBL strategically positions complex problems as the driving force behind curriculum development, thereby necessitating deep engagement and iterative refinement of understanding throughout the learning process.

PBL is underpinned by constructivist theories of learning, where the knowledge acquisition process is considered not merely the assimilation of facts, but the construction of meaning through direct experiences [9]. Vygotsky's social constructivism and Dewey's experiential learning theory are often cited in support of PBL, emphasizing its alignment with the principles of situated cognition and collaborative inquiry.

Within humanities and social sciences, PBL is recognized for its capacity to address complex, multifaceted issues that mirror real-world contexts [10]. The inherent ambiguity and interpretive richness of these fields resonate with the PBL ethos, fostering an environment where students negotiate the application of theoretical frameworks and critically examine diverse perspectives.

Adopting PBL in teaching mythology has seen a gradual, yet innovative evolution. Prior studies showcase teaching models where mythological epics become the central problems through which students explore themes such as morality, heroism, and human nature. The narratives provide a fertile ground for intertextual analysis and thematic exploration, effectively serving as multi-layered cases for PBL inquiry.

Despite its pedagogical potential, PBL's application to ancient Greek mythology is not devoid of challenges. This educational strategy demands substantial time for students to delve into problems, which, in the context of complex mythological texts, could stretch over extended periods. Further, the facilitator's role is critical; they must balance guidance with fostering independence, an intricate dance between providing structure and nurturing student autonomy. Nonetheless, the opportunities for deep, meaningful learning and the development of interpretative skills present an encouraging case for PBL within this academic niche, one that holds promise for an enriching educational experience that is both rigorous and engaging.

2.1 Educational Theories Supporting PBL

The pedagogical framework of Problem-Based Learning (PBL) is underpinned by a multitude of educational theories that endorse its efficacy as a method of instruction. Central to the foundation of PBL is Constructivism, as posited by Piaget and later elaborated by Vygotsky through the concept of the Zone of Proximal Development (ZPD), where learners construct knowledge through experiences and social interactions within their ZPD. PBL resonates with these Constructivist principles by emphasizing an active, student-centered learning process wherein knowledge is built by solving realistic problems in a collaborative environment.

Dewey's Experiential Learning Theory also aligns with the principles of PBL. Dewey advocates for education to be rooted in real-world experiences, arguing that knowledge is best acquired through a process of inquiry and problem-solving that reflects the way individuals naturally learn. PBL echoes this by presenting students with complex problems that require extensive exploration, promoting the notion that learning is a response to the need for problem resolution.

Another theory substantiating the PBL model is the Situated Cognition Theory, which suggests that knowledge is inseparable from the context in which it is learned. Brown, Collins, and Duguid emphasized that meaningful learning occurs when it is embedded in the social and physical context of its application. PBL employs this concept by integrating problems within the context of the discipline, like Ancient Greek mythology, allowing students to immerse themselves in the narratives and cultural significances that are intrinsic to the subject matter.

Moreover, the Socio-cultural Theory of learning, elaborated by Vygotsky, advocates for the importance of cultural tools and social interaction in cognitive development. PBL facilitates this through the implementation of cooperative learning strategies where learners engage with peers and educators to construct their understanding, mirroring the authentic collaborative scenarios they may encounter in scholarly and professional settings.

Finally, self-directed learning theory, which is an essential aspect of Andragogy as formulated by Knowles, supports the autonomy granted to students in PBL settings, enabling them to take responsibility for their learning journey. This autonomy is instrumental in fostering a sense of ownership and intrinsic motivation, key components for effective integration and retention of complex subject matter such as Ancient Greek mythology.

These educational theories collectively bolster the theoretical underpinnings of PBL and advocate for its implementation as a powerful educational tool in diverse learning contexts, including the domain of ancient Greek mythology. The learner-centered, problem-oriented, and contextually applied approach of PBL endorses it as a compatible and potentially transformative strategy for teaching and learning within the humanities and social sciences.

2.2 PBL in the Context of Humanities and Social Sciences

Problem-Based Learning (PBL) has been gaining traction within the humanities and social sciences as an educational approach that encourages students to engage deeply with course content. This pedagogical strategy aligns well with the exploratory and interpretive nature of these disciplines, promoting critical thinking, creative problem solving, and interdisciplinary connections. In disciplines such as history, literature, and philosophy, PBL's student-centered inquiry model allows for a multifaceted exploration of complex subjects, fostering a more nuanced and personal understanding among learners.

The contextualized learning in humanities and social sciences benefits from the immersive, scenario-based nature of PBL, where students are positioned within the ambiguous and often subjective situations that characterize human experiences and social dynamics. This mirrors real-life complexities and demands that students employ analytical rigor and empathetic understanding to navigate the intricacies of human behaviors, cultural nuances, and ethical considerations.

Moreover, the use of PBL in these fields enables the incorporation of divergent perspectives and the synthesis of knowledge from multiple sources. This is particularly beneficial when examining cultural phenomena, societal trends, and historical events. Students not only learn the content but also develop the capacity to critically appraise information, construct coherent arguments, and engage in thoughtful dialogue.

The humanities and social sciences lend themselves well to the iterative problem-solving processes of PBL, where repeat analysis, discussion, and reflection are keys to intellectual growth. As students work to understand and resolve problems set before them, they build on their interpretive and evaluative skills, which are core competencies within these academic areas. However, the adaptation of PBL in the humanities and social sciences faces its own set of challenges. There is a significant level of complexity involved in developing appropriate problems or case studies that accurately reflect the nuances of humanistic study. Moreover, the subjective aspects of these disciplines, which often lack clear-cut answers, may challenge the facilitation of a PBL curriculum and necessitate a flexible and adaptable approach.

In conclusion, PBL's application to the humanities and social sciences presents a promising opportunity to enrich the educational experience. By fostering an environment that values inquiry, discussion, and personal engagement with the material, PBL supports the development of a deeper and more critical understanding of the topics within these fields. This approach supports the idea that knowledge in the humanities and social sciences is not merely a collection of facts, but a dynamic tapestry woven from the threads of human thought, culture, and experience.

2.3 Previous Applications of PBL in Teaching Mythology

The pedagogical strategy of Problem-Based Learning (PBL) has long held a place in the pantheon of educational tactics, especially in the realm of mythology teaching. Its application ranges from conceptual understanding to the promotion of analysis and synthesis of mythological themes. One of the earliest inroads PBL made into the teaching of mythology was in the development of critical thinking skills, where students were tasked with dissecting the complex web of characters and narratives to solve broader questions concerning cultural and historical contexts.

Historically, PBL's intersection with mythology pedagogy can be identified through various case studies and educational experiments. These often sought to harness the narrative power of myths to create problems that extend beyond mere comprehension, challenging students to apply their knowledge in collaborative and innovative ways. One such example includes investigations into the multifaceted role of gods and heroes within ancient societies, prompting inquiries into ethical conduct, leadership, and societal norms—the fodder of engaging, problem-centric learning environments.

Moreover, educators have leveraged PBL as a bridge between ancient texts and contemporary issues. In practice, this involved framing age-old mythological conflicts within modern-day scenarios, encouraging students to draw parallels and propose resolutions informed by the wisdom encapsulated in these ancient tales. This method encouraged a more profound appreciation of the relevance and universality of Greek myths.

However, the facet where PBL has been particularly influential involves interdisciplinary projects, where elements of mythology are woven into broader curricula. For example, the interpretation of mythological themes has been integrated into research projects within literature, history, and even biochemistry programs, leveraging the narrative elements to develop scientific inquiry and research skills, as highlighted in the domain of biochemistry education.

There have been noted challenges, though, such as the difficulty in aligning the intricate, often non-linear narratives of Greek mythology with the structured framework typically employed by PBL. Yet, despite these challenges, PBL approaches to teaching mythology have proven beneficial in enhancing engagement and deepening understanding.

These educational initiatives shed light on the value of PBL as a means to not only interpret the myths but also to tease out the connective tissue between the ancient world and modern paradigms. Collectively, previous applications of PBL in teaching mythology demonstrate an enriching loop of inquiry and enlightenment, akin to the hermeneutic cycles found within these enduring narratives themselves.

2.4 Challenges and Opportunities in Adopting PBL for Ancient Greek Mythology

The incorporation of Problem-Based Learning (PBL) into the curriculum of Ancient Greek Mythology presents a unique set of challenges and opportunities that requires careful attention from educators. The challenges predominantly stem from the traditional pedagogical approaches to humanities, where linear, teacher-centered methodologies have been the norm. The transition from a didactic framework to one governed by PBL represents a shift in the educational paradigm that can lead to resistance among facilitators accustomed to conventional teaching methods. This transformation necessitates a reevaluation of educator roles from authoritative figures to co-learners and facilitators of discussions – a process that some educators may find daunting [11].

Designing problems or scenarios that effectively incorporate the vast and intricate lore of Ancient Greek Mythology is another significant challenge. PBL scenarios must be ill-structured to mimic real-life complexities [12], yet this lack of structure can sometimes overwhelm both students and educators. For instance, the vast body of knowledge may lead to scenarios with ambiguous triggers and inadequate information, thus stifling student engagement and hindering the formation of clear rationales.

Fiscal constraints also pose issues for effective PBL deployment. The need to frequently update scenarios to keep them current implies a continuous investment of resources. Anecdotal evidence indicates student dissatisfaction with self-directed elements of PBL, often due to inconsistencies in facilitation and a desire for more structured learning interventions to complement PBL's informal structure.

Nevertheless, the inclusion of PBL within the study of Ancient Greek Mythology offers substantial opportunities. By using PBL, educators empower students to delve deeply into mythological contexts, thereby promoting critical thinking and the integration of interdisciplinary knowledge [13]. This engagement allows students to traverse beyond rote memorization, enabling them to explore the narratives within the myths critically and to understand their relevance to contemporary issues. Moreover, the narrative nature of mythology aligns well with the student-centric inquiry that PBL facilitates. As students negotiate the complexities of Ancient Greek myths, they develop essential career skills such as analysis, synthesis, and evaluation – competencies favoured by Barrows' taxonomy for PBL [13]. PBL fosters an environment where students are incentivized to apply their learning to complex, real-world scenarios, encapsulating both the content knowledge and the soft skills necessary for professional development.

Exploring mythological themes through PBL additionally leads to a vibrant classroom dynamic, where students engage in rich discussions and debates, examining the philosophical and ethical underpinnings of ancient narratives. These conversations promote a deeper understanding of the material and cultivate a lifelong interest in the subject matter.

In conclusion, the application of PBL to the teaching of Ancient Greek Mythology demands an astute recognition of the approach's inherent challenges, particularly the need for competent facilitation and well-designed problems. Nonetheless, the method also offers significant opportunities for enriching the educational experience by embracing the inquiry-based, student-centered learning environment integral to PBL's philosophy. As educators and institutions navigate this educational conundrum, it is apparent that the successful implementation of PBL will hinge on the symbiotic relationship between addressing challenges and maximizing opportunities to enhance the learning of Ancient Greek Mythology.

3 METHODOLOGY

Analysis of reflective reports provides insights into the students' cognitive and metacognitive processes, with the aid of text mining software to detect trends and key themes. The analysis places significant importance on the critical evaluation of the students' own learning processes as well as their collaboration experiences. Network analysis of the keywords and concepts extracted from the collected data facilitates the visualization of connections between different facets of student learning and interaction patterns within PBL activities. Moreover, statistical analysis of questionnaire responses assesses the extent of knowledge gains and attitudinal shifts pre- and post-PBL intervention, underlining the methodological effectiveness or deficiencies as reflected in student outcomes. The analysis aims to construct a robust frame of reference for interpreting the applied Problem-Based Learning approach's efficacy within the domain of ancient Greek mythology education.

3.1 Research Design and Approach

This study employs a qualitative research design to systematically explore the implications of incorporating Problem-Based Learning (PBL) strategies into the teaching of ancient Greek mythology. The qualitative approach was chosen due to the interpretative nature of mythology as a subject matter and the exploratory focus of PBL on students' cognitive and affective learning processes.

Within this framework, the research approach consists of a multi-method strategy which orbits around the use of PBL as a pedagogical tool for teaching ancient Greek mythology. The core of the research design revolves around the development, implementation, and evaluation of PBL activities specifically tailored for this subject. These activities are structured to stimulate critical analysis, problem-solving, and collaborative learning amongst tertiary students, while also affirming the richness and narrative depth of ancient Greek mythology.

Embedded within the constructivist paradigm, the PBL activities for this study are intricately designed to mirror the complexity and nuance of mythological lore. This encompasses the presentation of problems that encourage students to draw upon diverse knowledge sources, including literary analysis, historical context, cultural studies, and philosophical inquiry.

The PBL approach in this research is characterized by iterative problem scenarios that allow for the gradual exploration of ancient Greek mythology. Students are given the autonomy to navigate their learning process, with the instructor acting as a facilitator rather than imparting knowledge directly. This aligns with the recognized benefits of PBL, including promotion of independence, development of research skills, and an increased propensity for lifelong learning.

The PBL tasks chosen for this study are designed as open-ended challenges that encourage a sustained engagement with the content over the course of the semester. This slow-release method not only affirms the learner's development of a more robust and interconnected understanding of mythology but also parallels the PBL principles of nurturing curiosity and self-directed learning.

The research approach prioritizes contextual and student-centered learning experiences, which involve stimulating critical discourse about the Greek myths and fostering an environment conducive to intellectual inquiry. To this end, PBL problems are crafted to reflect real-world dilemmas and theoretical quandaries derived from the mythological narratives.

The activities are planned in such a way that they accommodate both group-based and individual research, encouraging students to engage in discourse and debate regarding possible interpretations and applications of ancient mythology. This is aligned with the PBL ethos of constructing knowledge through collaborative effort and structured deliberation.

In conclusion, the pedagogical research approach designed for this paper is intimately interwoven with the principles of Problem-Based Learning as it pertains to the discipline of ancient Greek mythology. The methods are situated to capture the dynamism of mythology, engender a nuanced understanding within the learner, and promote an educational experience that marries the enduring allure of ancient stories with contemporary didactic practices.

3.2 Selection Criteria for PBL Activities and Case Studies

The selection of PBL activities and case studies in the context of ancient Greek mythology teaching is paramount to the success of the educational strategy. The criteria for selection hinge on several pivotal aspects that ensure the PBL activities are both engaging and educationally effective.

First, the complexity of the PBL task is considered. According to the literature, PBL tasks should be complex enough to challenge the students and promote critical thinking, but not so convoluted that they become overwhelming. Case studies and problems should therefore relate directly to key mythological narratives or themes and require multitiered analysis that prompts students to investigate historical, cultural, and literary perspectives.

Second, relevance to the curriculum and learning outcomes is essential. Each PBL activity must align with and contribute to the broader learning goals of the ancient Greek mythology course. The activities should encourage students to delve into the mythological content, discerning the underlying philosophical and psychological connotations, and establishing connections to modern day culture and society.

Thirdly, the duration and scope of PBL activities should be tailored for a progressive learning experience. As indicated by experiences in nursing education, a protracted engagement with a singular problem allows for greater depth of understanding and a more thorough exploration of related issues. Therefore, PBL activities must be designed to unfold over a period of time, allowing students to engage with and reflect on the material and their findings, facilitating iterative learning.

Fourth, the feasibility of the PBL tasks in terms of available resources must be scrutinized. Activities should be realistic in terms of the time available in the course schedule, the accessibility of research materials, and the capacity of facilitators to guide and support student learning in a thorough fashion.

Finally, criteria include the potential for PBL tasks to facilitate the development of high-level skills. Endorsed by educational bodies, the aim is for PBL activities to nurture essential competencies such as problem-solving, independent research, critical thinking, and lifelong learning skills. The case studies selected should therefore represent a blend of practical challenges and theoretical inquiries that prepare students for professional pursuits in fields that value such skills.

In conclusion, the selected PBL activities and case studies should present multifaceted problems that are intricate yet manageable, ensuring alignment with educational objectives, sustainability over the learning period, practical feasibility, and the enhancement of high-level career skills. Such a meticulous approach to selection will underpin the robust and dynamic learning experiences that PBL promises in the field of ancient Greek mythology.

3.3 Data Collection Methods

The data collection methods for this research are multi-faceted, designed to capture a comprehensive understanding of the application of the Problem-Based Learning (PBL) method in the teaching of ancient Greek mythology. Considering the interactive and student-centered nature of PBL, data were collected through both qualitative and quantitative measures to glean insights from multiple perspectives and provide a robust analysis of PBL's implementation and outcomes.

Firstly, semi-structured interviews were conducted with educators specialized in teaching ancient Greek mythology at the tertiary level. These interviews aimed to collect firsthand information about the educators' experiences with PBL, the strategies they employ, and the challenges they encounter. Interview questions focused on the adaptation process of PBL into their curriculum, their perception of student engagement, and the educational outcomes observed.

Secondly, surveys were administered to students who have participated in PBL-driven mythology courses. This quantitative measure provided data regarding students' perceived efficacy of the PBL method, their engagement levels, and the enhancement of their problem-solving and critical thinking skills. The survey included Likert-scale questions and open-ended prompts to elicit a comprehensive understanding of their learning experiences.

Thirdly, observational data were gathered through classroom visits. These visits allowed for the direct observation of PBL in action, including student interactions, the nature of problem-solving approaches utilized, and the alignment of activities with core PBL principles. Observational checklists were used to systematically document key aspects of the PBL environment and ensure consistency across different classrooms.

Additionally, a review of students' reflective journals and PBL project documents furnished qualitative data on the learning process from the student's perspective, revealing insights into cognitive and metacognitive strategies employed by students during the learning process.

Finally, video recordings of selected PBL sessions were analyzed to capture the dynamics of group interactions, the facilitation style of the instructor, and the evolution of the problem-solving discourse over time. Transcriptions of these recordings provided a narrative record of verbal exchanges that were later thematically analyzed.

All data collected were treated with strict confidentiality and analyzed anonymously to ensure the integrity of the research process. Triangulation of the data was employed to cross-verify information gathered from different sources, enhancing the trustworthiness and validity of the findings.

3.4 Analysis and Interpretation Techniques

The analytical phase of this study was built on qualitative and quantitative methodologies to scrutinize the collected data from our PBL activities. To facilitate a robust interpretation of findings from PBL implementation in the teaching of ancient Greek mythology, we employed a hybrid approach integrating both text mining and concept mapping techniques.

Text mining was utilized to evaluate reflection reports submitted following the PBL sessions. This process involved parsing through the textual data to identify frequency and co-occurrence of relevant keywords. The keywords were then assessed not merely by their prevalence but by the depth of their contextual significance. Such an approach allowed us to understand how concepts related to ancient Greek mythology were internalized and articulated by participants. Keywords of high importance, as identified through this process, included 'understanding', 'opinion', 'learning', 'self', 'interaction', and 'explanation'. These terms provided insights into students' cognitive processes and engagement levels during PBL activities. Upon the identification of these keywords, concept mapping was utilized to visualize the connections between them. This technique delineates the relationships among key terms, creating a framework that captures the conceptual changes and advancements in understanding among students. The relationships between keywords were represented through lines of varying thickness, with stronger relationships indicated by thicker lines. This representation was instrumental in identifying patterns of comprehension and clarifying the intellectual progress made by the students.

Additionally, the comparative analysis offered by looking at reflection report contents before and after PBL interventions revealed the pedagogical impact. It was evident that post-PBL reports were more reflective of deeper discussions, encompassing keywords such as 'discussion', 'explanation', and 'group' as opposed to more superficial indicators observed in the pre-PBL reports.

Through the application of these techniques, the study quantified the qualitative experiences of the students, thus allowing for a more nuanced understanding of the effectiveness of PBL in ancient Greek mythology instruction. This dual-analytical approach underscored the intricate balance between theoretical pedagogy and practical application, revealing an educational conundrum much like the paradoxes present in ancient Greek myths themselves. It is through this rigorous analysis and interpretation process that the study provided empirical support for the integration of PBL as a viable strategy in enhancing the comprehension and appreciation of Greek mythology in modern education settings.

4 IMPLEMENTATION OF PBL IN ANCIENT GREEK MYTHOLOGY

Innovative curriculum modules designed for ancient Greek mythology courses must integrate the PBL structure authentically. Module development begins with the identification of key problems grounded in mythological narratives which intrigue and challenge the intellectual curiosity of students. These problems act as crucial foci around which a learning journey unfolds. Integral to this process is the contextualization of ancient texts, ensuring that learners explore relevant historical, cultural, and literary dimensions, thus facilitating a multidimensional understanding.

Empirical exploration of PBL within the context of ancient Greek mythology reveals varied outcomes. Successes are evidenced when students exhibit enhanced critical thinking and develop the capability to draw multidisciplinary connections. Such cases often involve collaborative and reflective learning experiences informed by mythological content. Conversely, setbacks have been observed predominantly where insufficient facilitation impedes the PBL process or when the complexity of myths overwhelms the problem-solving framework, thus revealing the delicate balance required for PBL efficacy.

Feedback from those engaged in mythology courses using PBL methodologies indicates mixed receptions. Educators acknowledge the paradigm shift from traditional lecturing to a facilitator role, encouraging student autonomy but noting the challenge this transition poses. Students express appreciation for the active learning environment but are also critical of perceived lack of guidance and inconsistencies in assessment standards. Together, these responses highlight the necessity for adeptness and flexibility in the PBL facilitator's role.

To align with the objectives of PBL, assessment strategies in ancient Greek mythology must encapsulate both academic mastery and the ability to apply knowledge in problem-solving scenarios. Blended assessment approaches involving both formative and summative methods serve this purpose. Reflection-based tasks, peer assessments, and portfolio compilations offer nuanced insights into the individual's learning trajectory, whereas traditional examinations could also be adapted to evaluate the critical and analytical skills fostered through PBL in the realm of mythology.

4.1 Developing PBL Modules for Mythology Courses

Developing Problem-Based Learning (PBL) modules for Mythology Courses necessitates a comprehensive strategy to integrate ancient Greek mythology with the investigative nature of PBL. The primary objective of these modules is to foster a deep understanding of mythological narratives while concurrently enhancing students' critical thinking and problem-solving skills.

To construct a successful PBL module, educators must initially deconstruct the intricate mythology narratives to identify core problems or questions that ignite inquiry and debate. This phase of development involves transforming classical myths into problems that students can engage in and explore. Fundamental issues might range from ethical dilemmas depicted in the tales, to the societal impacts of ancient myths on contemporary culture. For instance, the paradox of fate versus free will in the Myth of Oedipus could serve as an engaging problem for student investigation.

The next step in module development is to create a learning environment conducive to PBL. This includes designing scenarios that require students to assume responsibility for their learning by seeking out and appraising various information sources, such as ancient texts, scholarly articles, archaeological evidence, and cross-cultural comparisons. The module could guide learners through the stages of identifying what they need to learn to address the problem at hand, developing research questions, and then conducting their inquiry.

Interdisciplinary approaches are encouraged within PBL modules for mythology courses. For example, incorporating elements of philosophy, history, art, and linguistics provides a rich, multifaceted view of ancient Greek mythology. In doing so, students will be able to unravel the multifarious purposes myths served in ancient societies, such as explanations of natural phenomena, codification of societal norms, and provision of existential meaning.

The design of PBL modules for mythology courses should also consider scaffolded learning experiences. Early tasks in the curriculum might guide the students through smaller problems, building up to more complex and abstract issues. This approach facilitates the progressive development of the necessary analytical and research skills required to tackle intricate mythological problems.

Lastly, for an effective implementation of PBL in mythology courses, each module must incorporate clear objectives, defined deliverables, and a framework for reflection and self-assessment. This structure enables students to recognize the development of their knowledge and skills, and provides educators with opportunities for formative feedback throughout the learning process. The PBL module could culminate in a student-driven presentation or paper that showcases their findings, conclusions, and the learning journey they have experienced.

In conclusion, developing PBL modules for mythology courses is an intricate process requiring careful planning and creativity. Educators must envisage mythology not merely as stories to be narrated, but as complex problems to be explored, ensuring the educational experiences are as multifaceted as the myths themselves.

4.2 Case Studies of PBL in Action: Successes and Setbacks

The implementation of Problem-Based Learning (PBL) in the realm of ancient Greek mythology education provides a fertile ground for scrutinizing its application through various case studies. These instances highlight the successes and setbacks experienced by educators and students, contributing to a comprehensive understanding of PBL's efficacy in this domain.

One case study conducted in a mythology course at a prominent university illustrates the successful use of PBL. In this scenario, students were presented with a complex problem: to explore the influence of Greek mythological characters on contemporary literature and culture. As the weeks unfolded, the students, through a collaborative learning process, dissected the problem layer by layer, revealing interconnections between ancient myths and modern narratives. This approach stimulated critical thinking and allowed students to develop a deep, contextual understanding of the myths. The facilitator played a crucial role in guiding the process while ensuring an equal contribution and engagement from each participant.

Conversely, a different case study revealed significant setbacks, predominantly rooted in group dynamics and assessment difficulties. In this case, the assigned problem required students to analyze the roles of women in Greek mythology and juxtapose them with modern-day gender roles. The group encountered friction as certain dominant group members dictated the direction of the analysis, thereby stifling the egalitarian principles of PBL. Furthermore, quieter students felt marginalized, causing an imbalance in participation and learning outcomes. The dilemma was exacerbated by stress over resource finding and apprehension about the authenticity of group contribution to the problem-solving process.

Feedback from these case studies has been dualistic. Educators reported that PBL enhances engagement and depth of learning when effectively managed. However, they have also recognized the need for vigilance in preventing unproductive group dynamics and ensuring equitable participation. From the students' perspective, the method was lauded for promoting self-directed learning and comprehension of complex mythological concepts. Nonetheless, some students have conveyed concerns over anxiety resulting from unclear course structure and imbalances in workload distribution.

These diverse experiences imply the need for a nuanced application of PBL in the teaching of ancient Greek mythology. Achieving a balance between preserving the core PBL tenets and adapting to the intricate subject matter of mythology is pivotal. Educators must not only tailor problems to be educationally meaningful and relevant but also hone their facilitation

skills to foster positive group experiences. The case studies reflect PBL's potential for empowering learners to navigate the elaborate labyrinth of Greek myths, reminiscent of the mythical puzzles themselves, while acknowledging the inherent challenges of the method.

4.3 Feedback from Educators and Students on PBL Experiences

The feedback from educators and students regarding the implementation of Problem-Based Learning (PBL) in courses on ancient Greek mythology has been multifaceted and illuminates both the potential benefits and the challenges faced during its application.

Educators have commented on the transformation of the classroom into a more dynamic and student-centered environment. They observed an increase in student engagement as individuals took ownership of their learning process, driven by the complex problems based on mythological narratives. In particular, educators noted that the students' ability to direct their own research and to work collaboratively to solve intricate mythological scenarios enhanced their critical-thinking skills.

However, educators have also reported certain impediments. One of the consistent challenges mentioned was the time needed to guide students through the process, which often required a rethinking of traditional teaching methods. Additionally, designing problems that were at an appropriate level of complexity proved to be difficult. There was the need for balance between guiding the students and allowing them the freedom to explore. It highlighted a need for careful planning and adaptability in implementing PBL modules.

Students provided feedback indicating their appreciation for a more active approach to learning, which was seen as a refreshing departure from memorization-based techniques. Many reported that their ability to retain information improved as a result of engaging deeply with the subject matter. The problem-solving aspect of PBL permitted a deeper understanding of Greek mythology, moving beyond the myths to exploring their cultural and historical contexts.

Nevertheless, student feedback also underscored some dissatisfaction. Some learners found the lack of structure and the open-ended nature of PBL to be unsettling when compared to traditional instructional methods. Others expressed concerns regarding the fairness of assessments deriving from such a divergent approach to learning, where individual contributions to group work could vary significantly.

Overall, the collected feedback signals a general optimism about the value of PBL in teaching ancient Greek mythology, tempered by recognition of the tactical difficulties encountered in practice. The experiences suggest that, while PBL aligns well with the goals of deep and reflective learning, it requires a considered approach to implementation. This involves anticipatory planning, scaffolding of learners, and a willingness to evolve assessment methods that capture the essence of PBL's educational objectives.

4.4 Assessment Strategies Aligned with PBL Goals

In the landscape of Problem-Based Learning (PBL), assessment strategies bear the critical role of not just evaluating the learning outcomes but also sustaining the pedagogical fidelity of PBL. The alignment of assessment with PBL goals in the domain of Ancient Greek Mythology involves a suite of evaluative mechanisms that are congruent with the ethos of inquiry and the cultivation of critical thinking.

Traditionally, assessment in academic settings has revolved around the regurgitation of memorized content, often through standard examinations. However, within a PBL framework, where learning is driven by problem-solving and student inquiry, assessments must venture beyond these conventional methods. They must strive to capture the depth of understanding, the application of knowledge, and the development of a research-oriented mindset, which are the hallmark goals of PBL.

Therefore, assessment strategies must be multifaceted, incorporating both formative and summative methods that deeply resonate with the iterative problem-solving process fundamental to PBL. Formative assessments, in particular, play a pivotal role in providing ongoing feedback and shaping the learning journey. These can include reflective journals, peer assessments, and progression artifacts, where students document their evolution of thought, collaboration, and engagement with the mythology content.

Summative assessments, on the other hand, can manifest as final projects or presentations, where students synthesize and present their findings. This encapsulates not only their grasp of mythological narratives but also their ability to connect ancient lore with enduring human and societal questions, thus showcasing their analytical and problem-solving skills.

The notion of student-led inquiry central to PBL necessitates that assessments involve self-evaluation components where learners assess their contributions and learning trajectories. This aligns with the ideology of fostering self-directed learners capable of critiquing their work and thought processes.

Moreover, given the emphasis on group work within PBL, it is essential to incorporate assessments that evaluate collaborative skills, distribution of workload, and the ability to integrate multiple viewpoints. The narrative complexity of Greek mythology, with its array of characters and interwoven themes, provides an ideal context for such collaborative explorations and the assessment thereof.

To adequately align assessment strategies with PBL goals in the context of Ancient Greek Mythology, educators must also consider rubrics that emphasize critical analysis of mythological texts, the ability to draw parallels to modern-day scenarios, and the intercultural understanding fostered by engaging with these timeless stories.

In summary, assessment strategies in PBL for Ancient Greek Mythology must foster a coherent synergy with the learning objectives of PBL—encouraging student autonomy, reflective practice, rigorous inquiry, and collaborative problem-solving. Through the tailored use of both formative and summative assessments, educators can not only gauge the effectiveness of PBL but also reinforce the centrality of student-driven, inquiry-based learning integral to the study of ancient texts.

5 DISCUSSION AND RECOMMENDATIONS

The qualitative shift towards a Problem-Based Learning (PBL) framework in the pedagogy of ancient Greek mythology has demonstrated a multifaceted impact on learning outcomes. PBL's engagement-centric ethos manifests in heightened critical thinking and investigative skills among students, who become both the artisans and beneficiaries of their educational trajectory. However, the complexity and extensive nature of mythological content requires a protracted period for problem exploration and knowledge acquisition. This incremental approach, while beneficial, can sometimes be at odds with rigid curricular timelines, suggesting that flexibility in course structures may be vital for the effective incorporation of PBL.

Balancing the aspirational ideals of PBL with the practicalities of teaching ancient Greek mythology invites a synthesis of theory and practice. PBL's theoretical underpinnings emphasize student autonomy and research-based learning, principles that align well with the exploratory nature of mythology. Practically, implementation strategies must contend with the varying interpretations and the diverse educational methodologies that currently exist. These considerations span the gamut from faculty training to resource allocation, underscoring the need for institutional support and adaptive teaching tactics that respect the individuality of the learning community.

To enhance PBL implementation in teaching Greek mythology, several strategies can be adopted. One pivotal approach is the development of robust and well-designed PBL tasks that resonate with the narrative depth of the myths, ensuring that students grapple with intellectually stimulating problems. The facilitator's role should evolve to one of guided support, fostering an environment where students' self-directed research and discovery are paramount. Additionally, integrating multi-disciplinary perspectives can enrich the learning experience, allowing students to examine myths through various scholarly lenses.

Future research endeavors should focus on empirical investigation to discern the long-term effectiveness of PBL in the realm of mythology education. Comparative studies across institutions, that take into account variations in PBL's execution, will be vital in drawing more generalizable conclusions. It is anticipated that the outcomes of such research will contribute to the refinement of PBL methodologies and their respective place within the broader pedagogical canon. In conclusion, while the PBL approach in ancient Greek mythology presents certain pedagogical conundrums akin to the complexity of the myths themselves, its propensity for fostering inquisitive and adaptable learners holds promise for a richer educational experience. As the narrative complexity of mythology and the inquiry-based approach of PBL continue to intersect, educators are invited to navigate the labyrinthine paths of teaching with the wisdom of Daedalus, ever mindful of the potential for innovation and transformation in learning.

5.1 Critical Evaluation of PBL's Impact on Learning Outcomes

In scrutinizing the application of Problem-Based Learning (PBL) to the discipline of ancient Greek mythology in tertiary education, a critical evaluation of its impact on learning outcomes is paramount. The inherent characteristics of PBL, which encompass student-driven inquiry and the development of problem-solving skills, are theorized to enhance the educational experience significantly. This approach encourages learners to engage deeply with complex mythological content, applying critical thinking to unravel the rich tapestry of ancient narratives.

Notwithstanding its pedagogic merits, the empirical evaluation of PBL's actual efficacy in improving learning outcomes presents a complex scenario. Samantha Wells, Philip Warelw & Karen Jackson indicate that while PBL is designed to unfurl complex problems gradually, providing learners with ample time to explore and refine their understanding, this educational strategy requires adjustment to fit diverse learning environments and student needs. Moreover, the progression towards a more profound grasp of the subject matter is predicated on students' capabilities to identify knowledge gaps and the aptitude to seek resolutions - a process that is facilitated but not guaranteed by PBL.

Enhanced student participation as an outcome is a prominent evaluation criterion for PBL effectiveness in teaching Greek mythology. This engagement is not only demonstrable in class discussions but also visible in the portfolio of research and analytical skills developed over time. Nevertheless, the spectrum of individual outcomes raises questions on standardization and equitable assessment—a common critique echoed by many researchers of PBL methodologies.

Although PBL's underpinning philosophy aligns with the interpretive and investigative nature of studying mythology, the empirical evidence of achieving superior learning outcomes is decidedly mixed. It is evidential that educators adopting PBL for Greek mythology must align instructional strategies to the complex narratives, deciphering not only mythological

content but also the process of inquiry itself. Furthermore, assessments of learning outcomes must adeptly measure both knowledge acquisition and the subtler skills of critical analysis, which are at the heart of PBL.

In summary, while PBL has the potential to significantly enrich the study of ancient Greek mythology by promoting active learning and higher-order thinking, its impact on learning outcomes is nuanced and must be evaluated with careful consideration of individual learner's progress and the challenges inherent in measuring such outcomes effectively. The consequent implications for pedagogic practices suggest that diligent and continuous refinement of PBL implementation strategies is essential in order to truly capitalize on its educational promise.

5.2 Synthesizing Theoretical and Practical Insights

The convergence of theoretical principles with practical applications of PBL in the context of ancient Greek mythology teaching presents a rich tapestry for educational exploration. Problem-Based Learning, as a pedagogical framework, undergirds the development of student-led inquiries, autonomy in learning, and the enhancement of critical thinking skills. Yet, in the practical realm, several intricacies emerge when adapting this theory to the specific domain of mythology.

PBL's theoretical backbone encourages an environment where students engage with content dynamically, centered around "problems" that resemble real-world scenarios. In the case of ancient Greek mythology, these problems could pertain to understanding the societal, cultural, and religious implications of the myths. Theoretically, this engagement allows for a deeper dive into the complexities and nuances of ancient narratives, fostering a sense of discovery and personal connection to the material.

However, when applied practically, educators often confront a gap between the idealized, student-led PBL model and the educational frameworks they traditionally operate within. The challenge arises in crafting problems that are suitably challenging and relevant, and that effectively integrate the historical and literary analysis required for a comprehensive understanding of Greek myths. There is a need for practical strategies that enable educators to design and maintain an authentic PBL experience that does not dilute the pedagogical goals.

In synthesizing the theoretical with the practical, the key insights focus on the importance of balance. Effective PBL implementation in mythology education must consider the cognitive load of students, the pedagogical intentions of using myths as educational tools, and the logistical concerns such as curriculum alignment and assessment standards. This blend ensures that the transformative potential of PBL in grappling with Greek myths is not lost in translation from theory to practice.

Educators are advised to be iterative in their approach, refining their PBL strategies in response to student feedback and evolving educational expectations. This iterative process acknowledges that, much like the evolving interpretation of myths over time, teaching methodologies should also be dynamic and responsive. Furthermore, the practical insights point towards a collaborative effort among educators to share best practices and develop communal resources for PBL activities, ensuring a collective elevation of the learning experience.

In essence, synthesizing the theoretical with the practical calls for an acknowledgment of the inherent complexities while striving for pedagogical innovation. It proposes that a nuanced and flexible approach to PBL, one which honors the intricacies of Greek mythology and the learning needs of students, can create a vivid and intellectually stimulating environment that aligns with the heart of PBL's educational philosophy.

5.3 Strategies for Enhancing PBL Implementation in Mythology Education

To optimize the application of Problem-Based Learning (PBL) within the realm of ancient Greek mythology education, a series of strategically underpinned measures are proposed to cater to the dynamic milieu of contemporary pedagogical demands. The integration of PBL into mythology studies warrants a multifaceted approach that aligns with the uniqueness of mythological content whilst fostering an environment conducive to inquiry-based learning. Herein, we outline strategies designed to enrich the PBL experience in the context of teaching ancient Greek mythology.

Firstly, it is imperative to construct well-defined problems that resonate the essence of Greek mythology while challenging students to engage critically with the material. These problems should provide just enough structure to induce curiosity but should not confine the thought process, thereby ensuring that students navigate through the complexities of the mythical narrative to find not a single, but multiple plausible solutions.

Secondly, educators are encouraged to facilitate interdisciplinary connections, making the study of ancient Greek mythology a holistic learning journey. By incorporating arts, literature, history, and philosophy, PBL can become a transdisciplinary endeavor, furnishing students with a panoramic view of the ancient Greek worldview and its bearing on contemporary life and thought.

Another strategy entails the implementation of a 'scaffolded' approach where initial guidance and support gradually taper off, enabling the development of independent learning skills. This 'scaffolding' could incorporate modeling thought processes, collaborative learning sessions, and the use of technology platforms that support interactive and collaborative exploration of Greek mythology content.

Furthermore, the adoption of reiterative feedback cycles within the PBL framework will promote continuous improvement and reflection. Providing formative feedback during the problem-solving process can help students to iteratively refine their analytical abilities and understanding of the subject matter.

The availability of diverse resources tailored to the PBL method can enhance the exploration of mythology. These resources could include primary texts, archaeological findings, and modern interpretations or adaptations of myths, thereby offering a pluralistic perspective on the ancient narratives which is critical to the success of PBL in this field.

To foster environments that stimulate student-driven learning, flexibility in curricular design is crucial. Allowing students to have a hand in the formation of their learning trajectories, such as selecting which myths to explore or what kind of projects to undertake, can drastically increase engagement and active participation in the PBL process.

Finally, continuous professional development for educators that centers on the integration of PBL into mythology education is essential. Tailored workshop sessions and sharing of best practices can empower teachers with the necessary skills to effectively orchestrate PBL activities and adapt to the evolving needs of students.

By synthesizing these strategies, the implementation of PBL in ancient Greek mythology education can be considerably augmented, potentially leading to an enriched learning experience that reveres the deep-seated stories of the past while bolstering the forethought required for modern-day academic inquiry.

5.4 Future Research Directions and Conclusion

The incorporation of the Problem-Based Learning (PBL) methodology into the teaching of ancient Greek mythology presents both numerous opportunities for enhanced student engagement and mastery of subject material, as well as challenges demanding further investigation. Recognizing the need for ongoing research, several directions appear particularly ripe for scholarly exploration.

Firstly, future research can delve into longitudinal studies that track the impact of PBL on learners over time, focusing on retention of mythological knowledge and the evolution of critical thinking and problem-solving abilities. Studies may comprise comparative analyses between PBL and traditional lecture-based learning environments within mythology education to substantiate claims about the efficacy of PBL.

Secondly, there is an opportunity to expand the demographic and cultural research base to include diverse educational contexts. This would provide insights into how different student populations, across various age groups and cultural backgrounds, engage with the PBL approach in the context of ancient Greek mythology.

Furthermore, the integration of technology within PBL is an emergent field that warrants attention. Research could investigate how digital tools, virtual simulations, and online collaborative platforms can be leveraged to enrich the PBL experience in mythology courses. Such studies would help educators understand the possibilities and limitations of technologically augmented PBL environments.

An additional avenue of research might explore the role of interdisciplinary approaches within PBL. This would entail examining how incorporating elements from other disciplines such as philosophy, history, and literature can create a more holistic and enriching learning experience for students studying ancient Greek mythology through PBL.

Finally, the shift towards PBL necessitates professional development and change management strategies for educators. Subsequent research could focus on the pedagogical shifts educators undergo, the administrative and institutional support required, and the impact of these on teaching efficacy within the realms of mythology education.

In conclusion, the PBL method exhibits a synergy with the complex narrative structure of Greek mythology, enabling an educational experience that is dynamic and explorative. However, the full capabilities and limitations of this approach within the specialized context of ancient Greek mythology remain to be wholly uncovered. Continued research in the aforementioned areas will not only enhance the understanding and practical implementation of PBL but will also contribute to a broader awareness of its suitability and adaptability in the diverse landscape of modern education. This exploration is crucial to advancing the field of mythology education, ensuring learning strategies meet the evolving needs of students, and maintaining the relevance of these age-old stories in contemporary pedagogical discourse.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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DESIGN OF COURSE EVALUATION SYSTEM BASED ON OUTCOMES-ORIENTED APPROACH - TAKE MOBILE COMMUNICATION COURSE AS AN EXAMPLE

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Abstract: This paper takes the mobile communication course of communication engineering major of Pingdingshan University as an example, and explores the research and practice path of a course evaluation system according to the pain points in the implementation process of the current science and technology course evaluation system. Firstly, from the perspective of ability outcomes, the course objectives are optimized. Secondly, the outcome-oriented "234" evaluation system is constructed. Aiming at the formative and summarized evaluation, evaluation activities are carried out before, during and after class, so as to achieve students corresponding course objectives. Thirdly, the assessment and evaluation characteristics of discipline competition replacement are formed to promote learning through competition. Finally, continuous improvement measures are adopted to form a closed-loop system of teaching quality evaluation, so as to promote the achievement of curriculum objectives and improve the quality of talent training.

Keywords: Mobile communication; Evaluation system; Outcome-oriented; Competition replacement

1 INTRODUCTION

With the continuous promotion of the concept of engineering education certification, the core of teaching quality assurance is to adhere to the student-centered teaching concept, establish an outcome-oriented curriculum evaluation system, and effectively implement the teaching quality assurance. Outcome-oriented education is an important concept and guiding ideology of engineering education certification[1]. It is organized and carries out teaching based on the level and achievement degree of students learning results. The goal of teaching design and teaching implementation is the final learning results of students through the educational process, that is, students can apply what they have learned in the course to practice and reach certain standards. Therefore, in the monitoring and evaluation of teaching quality, it should not be carried out in accordance with the traditional classroom listening, teaching inspection, student evaluation and other ways, but to focus on the achievement of the course objectives and the support of the corresponding graduation requirements[2].

The outcome-oriented curriculum assessment and evaluation design is a structural mode of organizing, implementing and evaluating education with the learning achievements achieved by students through the educational process as the core. It is to put the teaching objectives (i. e., students expected learning outcome) in the central position of teaching activity design, develop the selection of teaching content, the setting of teaching links and the organization of teaching process around this goal, and finally verify the achievement of teaching objectives through reasonable assessment and evaluation methods[3]. In the current engineering of professional courses, most of the professional course evaluation content does not gather students ability outcome, single evaluation way, evaluation results lack of effective feedback mechanism of pain points, lead to students should have insufficient comprehensive ability, course objectives to achieve evaluation situation is poor, not forming teaching effect phenomenon such as continuous ascension[4].

In this paper, communication engineering core mobile communication courses, for example, by optimizing the course objectives, and around the course target using a variety of teaching methods, build based on outcome-oriented curriculum evaluation system, curriculum evaluation standard, pay attention to the combination of process assessment and final assessment, through diversified assessment way of comprehensive evaluation of students learning results. So as to ensure that students learning results can meet the expected curriculum objectives.

2 DESIGN OF THE OUTCOME-ORIENTED CURRICULUM EVALUATION SYSTEM

The mobile communication course emphasizes the combination of theory and practice, covering complex theories such as wireless communication model, modulation and demodulation technology, and integrating multidisciplinary knowledge such as electromagnetic wave propagation, digital signal processing and communication principles[5]. With the rapid development of mobile communication technology, the courses need to follow the forefront of the industry and cover the latest technological advances. The course focuses on application orientation and focuses on cultivating students ability to solve complex communication system problems around practical application scenarios. Therefore, the assessment and evaluation design of mobile communication courses should comprehensively and systematically evaluate students learning effect, including both the mastery of theoretical knowledge and the application of practical skills. This summary will design the assessment and evaluation scheme of mobile communication from three aspects: course objective optimization, evaluation scheme design, and assessment characteristics.

2.1 Optimize the Course Objectives

According to the graduation requirements supported by the course and the needs of personalized development, the course objectives of mobile communication are optimized and the supporting ability corresponding to each course objective is determined. Clarify the assessment standards of course objectives, and take them as the basis for the implementation of the teaching process and the evaluation of learning results. In accordance with the requirements of training communication engineering professionals and following the guiding ideology of ability training oriented, this course forms four course objectives in accordance with the index points of the supported graduation requirements:

- (1) To understand and express the processing, networking and transmission process of communication signals by combining the application scenarios of mobile communication systems in different times, and solve the problems such as channel loss, environmental interference, multi-path fading and multiple access in the mobile communication system by selecting appropriate technologies and methods, so as to realize the design and optimization of the system scheme.
- (2) To select the appropriate communication module, design, debug and realize the comprehensive communication system, and explain and analyze the experimental effect.
- (3) To combine the background of the industry and the scientific principles of the mobile communication technology to explain the influence of the new technologies in the mobile communication system in society, health, safety, law and culture.
- (4) To carry out effective group communication and communication in the process of experimental system design, and effectively express the experimental design problems through explanation and defense.

2.2 Formulate the "234" Course Evaluation System

The course has formulated a "234" evaluation system, which adopts the evaluation methods combining formative evaluation and summarized evaluation to achieve the four curriculum objectives in three evaluation dimensions before class, during class and after class. The evaluation system design is shown in Figure 1.

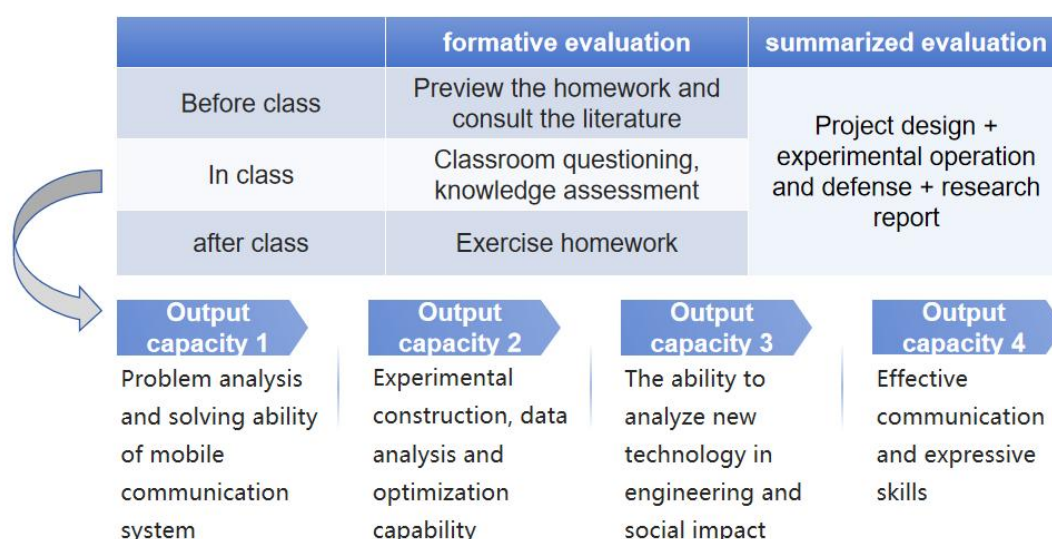


Figure 1 "234" Evaluation System

Through formative evaluation, the learning network course platform is used to track students learning status in real time, and a formative evaluation scheme with "preview task-classroom assessment-exercise-homework" as the core achievement is constructed, so as to timely capture students specific performance in knowledge mastery, skill application and problem solving. Through the summary evaluation, the summary assessment and evaluation scheme with "project design-experiment operation and defense-research report" as the core results is constructed. The specific summary evaluation and assessment design is as follows:

2.2.1 Project design

The project design scheme of the mobile communication course takes the actual engineering case as the entry point, and the base station construction and optimization project in the campus of Pingdingshan College is selected as the core practice content. Through the application of real scenes, students can personally experience the transformation process from theory to practice, and deepen the understanding of mobile communication principles, network planning, base station layout and optimization technology. The main assessment contents are as follows:

- (1) The project design shall cover the project design background, network architecture, scheme analysis, scheme design, effect analysis and summary; the project design can fully reflect the design idea and design process, and design and realize the project solution.

(2) Follow the scheme design, fully consider the functional requirements of the scenario; leave sufficient allowance and upgrade space in structure and performance; follow advanced industry standards; follow the principle of reasonable structure, high efficiency and low cost; have flexible user use and management.

(3) Through project demand analysis, the project makes detailed planning and design, can reasonably select technology, design and optimize mobile communication network, and complete network planning with engineering management methods in a multi-disciplinary environment.

(4) According to the scheme planning and design requirements, select the corresponding technologies (networking, channel loss, modulation and demodulation, environmental interference, multi-path fading and multiple access, etc., select no less than 6 technologies) to complete the network design and optimization, and analyze whether the project has achieved the expected results through the results.

(5) Complete the writing of the project design, including: project overview, planning and design, program implementation, summary, references, etc.

(6) The report structure is reasonable, standard format and accurate expression of professional terms.

2.2.2 Experimental operation and defense

The experimental content not only involves the application of theoretical knowledge, but also emphasizes the problem-solving ability in practical operation. By practicing the experimental tasks of the complex mobile communication system, students can deeply understand the working principle of the mobile communication system and the complexity in its actual operation. Experimental assessment requirements:

Experimental report: Write the experimental report according to the requirements, design, analysis, effect and other requirements, methods and specific process of mobile communication application scenarios.

Group task: In the comprehensive experimental learning, select appropriate tools, complete the experimental content, complete the mobile communication application scenario with effective conclusions, and make group summary and defense.

2.2.3 Research report

Homework requires students to consult the latest 5G communication technology related literature, research reports, industry standards and patent information, etc., the content should cover the core technology characteristics of 5G, such as high speed, large capacity connection, low latency, communication, and these technologies in practical application, such as wisdom city, autopilot, 5G application in the field of remote medical exploration. By summarizing the key progress and innovation points of 5G communication technology, the advantages and disadvantages of different technical solutions are compared and analyzed, and the challenges and possible solutions are discussed. The report encourages the integration of personal insights to predict the future direction of 5G communication technology or make suggestions for improvement, so as to exercise students critical thinking and innovation ability. The assessment requirements of this operation are as follows:

(1) To explain the basic concepts and characteristics of 5G mobile communication;

(2) Familiar with key technologies and application scenarios in 5G technology, able to combine examples to analyze 5G scenarios;

(3) To explain the future development and influence of new 5G communication technologies in terms of society, health, safety, law and culture.

2.3 Form the Assessment Characteristics of Discipline Competition Replacement

This course insists on the principle of "promoting learning, teaching and innovation" through the whole process of talent training. By integrating the knowledge learned in class, students are actively encouraged to participate in the discipline competition in mobile communication to broaden students knowledge and exercise their practical ability, teamwork ability and innovation ability. Through the innovative implementation of the mechanism of "discipline competition replacement of usual work", the reform aims to break the limitation of emphasizing theory rather than practice in the traditional assessment and evaluation. By clarifying the replacement standards and procedures, students are encouraged to put the knowledge into the discipline competition, and replace the competition results as part of the usual work. This move not only stimulates the students learning motivation, but also promotes the practical application of knowledge, and comprehensively improves the students comprehensive quality.

Through discussion, the course team has formulated detailed and standard performance identification standards, and defined the replacement proportion and specific requirements of different competition awards. At the same time, the course team teachers will strictly review the submitted competition results to ensure the accuracy and fairness of the results. Students who have won prizes in mobile communication competitions are allowed to use their certificates to replace the results in the course assessment method. This measure can not only greatly broaden students knowledge, but also exercise their practical ability, teamwork ability and innovation ability. Table 1 below shows the performance criteria of the first semester of 2023-2024, and the winning level of mobile communication discipline competition.

Table 1 Replacement Results of the Winning Grades

Award level of mobile communication discipline competition	Replacement research report results
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National first prize	A++
National second prize	A+
National third prize	A
Provincial first prize	A
Provincial second prize	B++
Provincial third prize	B+
Provincial excellence d prize	B

The course team will dynamically adjust and optimize all aspects of the competition replacement according to the students learning situation and feedback, as well as the changes and development trends of the competition environment. This dynamic adjustment and optimization mechanism helps to ensure that the competition replacement assessment mechanism always conforms to the development of The Times, and provides students with a more scientific and reasonable evaluation system.

3 FORM A CONTINUOUS IMPROVEMENT CLOSED-LOOP SYSTEM

3.1 Actively Carry out Feedback and Continuous Improvement Work

Every semester, according to the evaluation results of the course objectives, actively feedback and continuous improvement are carried out to ensure the continuous optimization and improvement of the evaluation mechanism and form a benign closed-loop system of course evaluation. Specifically, according to the evaluation results, the school teachers are organized to carry out systematic lesson preparation, teaching research and grinding activities, so as to improve the scientific and rationality of teaching design. At the same time, it provides accurate assistance and guidance for new teachers and teachers with insufficient teaching experience to help them improve their teaching ability and classroom management level. Through collective lesson preparation and repeated grinding, to ensure the depth and breadth of teaching content and the effectiveness of teaching methods, to ensure that students can achieve the expected learning goals both inside and outside the classroom.

3.2 Continue to Strengthen the Curriculum Construction

In addition, outside the school, further strengthen the cooperation with the internship base, especially in the construction of curriculum resources. Through the communication and cooperation with the internship base, it can not only help students to better combine theoretical knowledge with practical application, but also optimize the course content and teaching methods according to the feedback in the internship. Combined with the achievement of the course objective evaluation, the teaching case resources should be expanded and updated to ensure the frontier and practicability of the teaching content. In addition, students should actively explore and adopt diversified teaching methods, such as project-based learning, case analysis, situational simulation, etc., to enhance students ability to analyze and solve problems in complex environments. Through the close combination of theory and practice, to promote the comprehensive improvement of students professional ability, comprehensive quality and innovation ability.

4 CONCLUSION

By adopting an outcome-oriented approach to designing the mobile communication curriculum evaluation system, this paper introduces the "234" evaluation system. This system fosters a profound integration of theory and practice, empowering students with flexibility in project design, experimental execution, and research report compilation. Consequently, their professional skills undergo marked improvement. The introduction of competitive assessment mechanisms effectively sparks students' interest in learning, motivating them to actively participate in national competitions such as the National College Students Mobile Communication 5G Technology Competition and the National College Students Huawei ICT Competition. As a result, students have secured ten national awards and over thirty provincial accolades in 5G mobile communication technology and related fields, significantly bolstering their employability and laying a solid foundation for their future careers.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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HOW POPULATION MOBILITY SHAPES CLIMATE BEHAVIOR: MECHANISMS AND EVIDENCE FROM CHINA'S FLOATING POPULATION

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Abstract: This paper explores the impact mechanisms of population mobility on climate behavior. Based on survey data derived from telecommunications big data, it employs a path analysis model and a logistic regression model to examine the characteristics of the floating population regarding energy conservation, emission reduction, resource conservation, green travel, and other climate behaviors. Additionally, it investigates the mediating roles of climate cognition and economic rationality in climate behavior decisions. The results show that the floating population is more inclined toward climate-friendly behavior patterns than the local population, and population mobility can promote climate mitigation behavior both directly and indirectly. The floating population exhibits heterogeneity in different climate mitigation behaviors, and climate cognition partially explains the differences in these behaviors. However, even after controlling for climate cognition, the floating population remains more proactive in energy conservation, emission reduction, resource conservation, and green travel. The floating population considers the balance between economic and environmental factors in climate behavior decisions, and the mediating roles of climate cognition and economic rationality constitute the mechanisms through which population mobility impacts climate behavior. This paper has theoretical and practical value for understanding the intrinsic link between population mobility and climate change, as well as for promoting low-carbon emission reduction participation across society.

Keywords: Population mobility; Climate behavior; Impact mechanisms

1 INTRODUCTION

Climate change is currently the most pressing global environmental issue[1]. As one of the largest developing countries in the world, China has submitted its Nationally Determined Contributions document to the Secretariat of the United Nations Framework Convention on Climate Change, pledging to reach peak emissions by around 2030 and striving to achieve carbon neutrality by 2060. China's "dual carbon" goal is a policy-driven climate action plan[2]. This requires policymakers to balance social, economic, and environmental effects while considering public values[3]. To achieve this goal, the Chinese government explicitly stated: "Unite the consensus of the whole society, advocate green low-carbon lifestyles, and accelerate the formation of a good pattern involving everyone's participation."

Currently, the number of China's floating population has reached 376 million, accounting for about one-fifth of the total population and approximately one-quarter of the labor force. The influence mechanism of the floating population on climate behavior is complex, as they are both participants and stakeholders in climate actions. With the continuous growth of the floating population, studying their climate behavior characteristics and revealing the influence mechanisms of population mobility on climate behavior provides a theoretical basis for formulating and implementing effective climate policies. This research aims to deliver accurate policy foundations for advocating public emission reduction and promoting low-carbon green consumption.

Therefore, this paper aims to explore the influence mechanisms of population mobility on climate behavior to provide policy references for China's carbon peaking and carbon neutrality goals. This study will utilize big data analysis and questionnaire surveys, focusing on the living and working environments, values, and consumption habits of the floating population, and exploring their impacts on climate behavior. It is hoped that the results of this study will offer an important theoretical foundation for formulating and implementing climate policies, thereby promoting public emission reduction and low-carbon green consumption.

2 LITERATURE REVIEW

Addressing climate change and implementing "dual carbon" actions represent a nascent field in environmental research, lacking a fully mature theoretical framework. Climate change, as a specific environmental phenomenon, necessitates further exploration and enhancement of existing environmental science theories to improve their applicability in studying the relationship between population dynamics and climate change. This paper focuses its literature analysis on the relationship between population migration, mobility, and environmental/climate change, exploring the intrinsic links and theoretical logic connecting population mobility and climate behavior, while identifying the theoretical gaps and

empirical dilemmas that persist in this area.

Research on the relationship between population migration and climate change reveals two distinct value orientations. The first is the population-environment-friendly theoretical perspective, which posits that the consumption patterns and environmental awareness of mobile populations or migrants tend to be more climate-friendly compared to those of local populations in developed areas. Their environmentally friendly behaviors, particularly in energy conservation, waste reduction, and low-carbon travel, are more pronounced[4-6]. Conversely, the second perspective suggests that mobile populations or migrants may be more inclined to tolerate poorer working and living conditions for economic benefits such as higher wages. This leads to their excessive concentration in impoverished communities or environmentally degraded areas, suggesting that the empirical relationship between mobile populations and environmental/climate change should not be interpreted as a straightforward causal link[7,8].

The theoretical interpretation of the relationship between population pressure and environmental degradation remains contentious, with arguments emphasizing that economic, technological, consumption, and urbanization factors are the primary drivers of environmental degradation under population pressure[9]. Existing empirical evidence is insufficient to substantiate the view that population mobility or migration directly leads to environmental degradation[10]. Furthermore, the impact of population mobility on climate behavior is influenced by various factors, including social, economic, cultural, and institutional elements, indicating that no single theory can comprehensively explain this relationship. Necessary empirical research focused on specific regions, time periods, and populations holds both theoretical and practical significance.

In summary, climate change as an environmental event entails theoretical controversies regarding the population-environment relationship within the realm of migration and climate behavior research. The impact of population mobility on climate behavior is shaped not only by diverse factors such as society, economy, culture, and institutions but also requires more empirical studies for support and clarification. In-depth research on the relationship between population mobility and climate change will facilitate a better understanding of climate change impacts and promote sustainable development in the population-environment nexus.

3 RESEARCH HYPOTHESIS

The socio-economic environment and characteristics of population migration in China differ significantly from those in Western countries and historical contexts. Migrant populations adapt their lifestyles to the changing socio-economic landscape to better integrate into society. These selective and adaptive traits lead migrants to exhibit environmentally friendly tendencies, which, in turn, encourage them to adopt climate-friendly behaviors.

Based on existing theoretical perspectives and empirical research, the selective and adaptive characteristics of migrant populations result in their inclination toward environmentally friendly cultural concepts, psychological identification, and behavioral patterns. Consequently, they are more likely to choose low-carbon lifestyles[5]. The consumption patterns of migrant populations are influenced by environmental factors and economic conditions, leading them to select more environmentally friendly modes of transportation[11] and exhibit lower carbon emissions[6]. Furthermore, migrants' awareness and attitudes toward climate-friendly behaviors significantly impact their willingness to accept and support relevant policy measures[12,13].

In summary, this study hypothesizes that migrant populations demonstrate a preference for climate-friendly behaviors, and their selective and adaptive characteristics make them more inclined to adopt environmentally friendly lifestyles and transportation modes. This research hypothesis is crucial for understanding the intrinsic mechanisms underlying the relationship between population migration and climate change, and it provides both theoretical and practical support for achieving China's carbon peaking and carbon neutrality goals.

4 DATA AND METHODS

4.1 Data Description

This paper utilizes online survey data derived from the telecommunications big data of the Shenzhen Social Science Key Research Base's project titled "Research on the Socio-economic Impact and Implementation Path of Carbon Peaking and Carbon Neutrality in Megacities." The micro-level individual information related to climate change concepts, attitudes, and behaviors originates from this data source.

The survey plan is as follows: First, Beijing, Shanghai, Guangzhou, and Shenzhen are selected as survey cities to adequately represent climate change-related issues in megacities. Second, the representative sample consists of permanent residents aged 18 or older, with a target sample size of 2,000 individuals (approximately 500 per city) to ensure broad coverage. Third, random sampling is conducted using telecommunications big data, focusing on mobile phone users who experienced signal roaming locally at least once a week during the six months preceding the survey, defining those active locally every week in that timeframe as permanent residents. Fourth, to enhance the response rate of the online survey, a telecommunications service provider is commissioned to send survey invitations on behalf of the researchers, including information about the survey's purpose, significance, the questionnaire app, and confidentiality clauses. Fifth, the online survey commenced in June 2021, with text messages dispatched to potential respondents until the target sample size was reached. Lastly, 200 respondents were randomly selected from the collected samples for telephone callbacks to verify the reliability and validity of the questionnaire.

The survey questionnaire includes dependent variables, independent variables, and control variables necessary for this

study. Climate change-related issues are measured using a Likert scale, where respondents indicate their level of agreement with climate change issues. Specifically, the scale ranges from 1 to 5, with 1 representing "strongly disagree" and 5 representing "strongly agree." Additionally, the respondent's household registration location serves as an indicator of migrant status, while demographic, social, and economic factors constitute the control variables.

To mitigate systematic errors, respondents are informed in advance that they are participating in a survey on social issues, without disclosing its focus on climate behavior, thus controlling for selective participation. A summary assessment of the survey results reveals that 8,032 text messages were sent, yielding a response rate of 24.90%. Following a logicity check, 1,992 valid questionnaires were obtained, with a callback accuracy rate of 98.69% when comparing the callback survey results with the retrieved questionnaires.

4.2 Dependent Variables

In this study, voluntary behaviors characterized by environmental and low-carbon attributes in respondents' daily lives are collectively referred to as climate mitigation behaviors. Regarding question design, the survey inquires whether respondents have engaged in specific behaviors in the past, rather than their expectations for future actions, to more accurately reflect actual behavior and reduce self-reporting bias[14].

Respondents self-report their response levels based on question statements, indicating that a higher value corresponds to a higher response level. Table 1 details the content of the climate concepts and behaviors questions, including classifications, question statements, scoring methods, response levels, and the associated concepts for each question.

Table 1 Description of Climate Behavior Question Items

	Questions	Concepts
Climate Concepts (A)	A1. Do you think that climate change is now or will have adverse effects on us in the future?	Climate Concern
	A2. Do you think society can make a positive contribution to addressing climate change?	Social contribution to mitigating climate change
	A3. Do you think individuals can make their own contributions to addressing climate change?	Individual contribution to mitigating climate change
	1. Strongly disagree; 2. Disagree; 3. Don't know; 4. Agree; 5. Strongly agree	Likert scale values
Climate Mitigation Behavior (B)	In the past year, have you taken any of the following daily actions to mitigate climate change:	
	B1. Waste sorting	Waste sorting
	B2. Reduce household energy consumption	Energy saving and emission reduction
	B3. Reuse of water, shopping bags, etc.	Resource conservation
	B4. Change transportation mode due to carbon emission reasons (bus, carpooling, etc.)	Green travel
	B5. Change travel destination due to carbon emission reasons	Long-distance travel
	1. Strongly disagree; 2. Disagree; 3. Don't know; 4. Agree; 5. Strongly agree	Likert scale values

Table 2 is a summary statistical description of climate-related concepts and behavior questions, as well as a consistency test between the migrant population and the local population. The results show that the approval rate for climate-related concept questions is between 70% and 99%, and the approval rate for the migrant population is higher, with similar conclusions in related studies. The approval rate for climate mitigation behaviors varies greatly, with a lower approval rate for long-distance travel and a higher approval rate for energy-saving and emission reduction. Overall, the approval rate of the migrant population for the issues involved is higher than that of the local population, and the difference in the mean approval rate for most questions is statistically significant.

Table 2 Statistical Description of Dependent Variables

	Local population (n=1239)			Floating population (n=753)			Difference ⁴
	Approval rate ¹	Mean ³	standard deviation	Approval rate	average	standard deviation	
	(%)	(X)	n	(%)	(Y)	n	
A1. Climate concern	92.22	4.51	0.84	98.19	4.82	0.55	0.30
A2. Social contribution to climate change mitigation	74.53	3.83	1.26	89.44	4.37	1.00	0.54 ***
A3. Individual contribution to climate change mitigation	72.12	3.79	1.31	87.10	4.30	0.99	0.51 ***
A composite index (CCP_index) ²	N/A	12.28	2.99	N/A	13.43	2.15	1.25 ***
B1. Garbage classification	75.08	3.76	1.20	78.07	3.91	1.20	0.16
B2. Energy saving and	87.28	4.29	1.06	94.23	4.60	0.85	0.31 **

emission reduction							
B3. Resource saving	81.58	3.95	1.11	88.48	4.27	1.00	0.31 **
B4. Green travel	57.32	3.29	1.40	63.27	3.52	1.47	0.23 *
B5. Long-distance travel	41.42	2.78	1.34	53.35	3.19	1.51	0.41 ***
B composite index (CMB index)	N/A	15.88	5.27	N/A	17.99	5.12	2.12 ***

Note: 1. The approval rate refers to the proportion of Likert scale scores 4 and 5 in Table 1. 2. The composite index is the sum of Likert scale scores, with A and B ranges of 3-15 and 5-25, respectively. 3. The mean is the average of Likert scale scores. 4. The difference = the average approval rate of the floating population - the average approval rate of the local population, using a two-sided t-test. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

4.3 Independent Variables

Table 3 presents the statistical description of the independent variables, with the core independent variable being the floating population dummy variable (1 = floating population, 0 = local population). Notably, 37.80% of respondents belong to the floating population. This paper aims to examine the relationship between the floating population and climate behavior variables, testing the mechanisms of population mobility on climate mitigation behavior while controlling for socio-economic factors that may influence this relationship.

The remaining variables in Table 3 serve as control variables. Regarding age, the floating population is significantly younger than the local population, with an average age difference of 5.70 years. While some studies have indicated that older respondents are more likely to support climate mitigation policies[15], recent empirical findings suggest that, when controlling for other factors, younger individuals show greater concern for climate change than their older counterparts[16]. Thus, a correlation between age and climate behavior may exist.

In terms of gender, the social role expectations for women differ markedly from those for men, with women generally exhibiting preferences for risk aversion and altruism[17], often translating to more environmentally friendly behaviors in climate change contexts[18]. Therefore, gender may also influence climate behavior.

Public education and information dissemination are recognized as effective tools for addressing climate change[19], with individuals holding higher education levels more likely to accept scientific information and recognize potential climate risks[20]. Hence, education may positively impact climate behavior.

Income, as an indicator of affluence, is frequently employed as an explanatory variable in environmental research. The Environmental Kuznets Curve[21] posits an "∩" relationship between income and environmental degradation; before reaching a peak income level, increased income is associated with higher environmental emissions. Consequently, this paper considers income level as a factor influencing climate behavior.

Daily commuting by car is treated as a binary variable, with 93% of the local population and 75% of the floating population engaging in daily car use. Although perceptions of climate change among daily car drivers may vary, some individuals alter their driving behavior for environmental reasons[22]. Thus, there may be a relationship between the "daily car commuting" variable and climate behavior.

Research indicates that economic shocks negatively affect environmental perceptions, particularly among the labor force[23]. Therefore, employment status (employed) is included to identify the labor participation status of respondents, with 68% of the local population and 76% of the floating population being employed. The labor participation rate among the floating population is significantly higher than that of the local population, aligning with the basic economic characteristics of China's floating population[24].

The "urban-rural" variable is used to assess the urban-rural attributes of respondents. Among the local population, 87% are urban residents, while only 45% of the floating population hail from urban areas. Rural residents typically demonstrate lower political participation awareness compared to their urban counterparts and tend to adopt more conservative climate perceptions[25]. Additionally, some environmentally unfriendly behaviors, such as reliance on biomass energy in rural areas, negatively impact the environment[26].

Table 3 Statistical Description of Independent Variables

variable	variable name	Local population (n=1239)		Floating population (n=753)		Difference ₁ YX
		Mean (X)	standard deviation	Mean (Y)	standard deviation	
age)	<i>age</i>	43.75	13.63	38.06	12.18	-5.70 ***
Gender (male=1; female=0)	<i>sex</i>	0.48	0.37	0.52	0.35	0.04
Years of education (years)	<i>edu</i>	12.16	8.12	11.33	7.61	-0.83
Personal annual income (10,000 yuan)	<i>income</i>	7.89	6.59	5.11	4.05	-2.78 ***
Daily commuting by car (1=yes; 0=no)	<i>d_car</i>	0.93	0.36	0.75	0.37	-0.18 **
Employment status (1=active; 0=not active)	<i>job</i>	0.68	0.53	0.76	0.71	0.08 **
Student (1=yes; 0=no)	<i>stu</i>	0.15	0.21	0.18	0.28	0.03 *
retired (1=yes; 0=no)	<i>ret</i>	0.14	0.27	0.04	0.13	-0.10 *

Unemployed (1=yes; 0=no)	<i>une</i>	0.03	0.14	0.02	0.16	-0.01
Urban and rural (urban=1; rural=0)	<i>u_r</i>	0.87	0.38	0.45	0.49	-0.43 **

Note: 1. The difference - the mean value of the floating population - the mean value of the local population, using a two-sided t test. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

4.4 Research Methods

(1) Analysis of the population mobility effect on the climate behavior composite index. A common method for analyzing Likert scales with interconnected questions is to calculate the composite index of the scores of each question[27] and use Cronbach's alpha to assess the reliability of the composite index. The calculation formula for the climate behavior composite index in this study is as follows:

$$C_index = \sum_{i=1}^n X_i \quad (1)$$

In the formula, C_index is the composite index; X_i is the score of the i th question, with a range of 1~5; n is the number of questions.

Climate perceptions are crucial to the climate adaptation process and potential mitigation behaviors[23], which may influence people's daily climate mitigation actions. The differences in climate perceptions themselves can explain part of the differences in climate mitigation behaviors[20]. The statistical description in Table 2 shows that the floating population has strong climate perceptions, and the climate perception composite index as a mediating variable may partially explain the reason for the higher climate behavior composite index scores of the floating population (indirect effect). To statistically test this possibility, this study adopts a path analysis model for causal analysis of the climate behavior composite index. The mathematical expression is as follows:

$$\begin{bmatrix} Y_1 \\ Y_2 \end{bmatrix} = \begin{bmatrix} 0 \\ \beta_{12} \end{bmatrix} \times Y_1 + \begin{bmatrix} \gamma_{11} & \dots & \gamma_{18} \\ \gamma_{21} & \dots & \gamma_{28} \end{bmatrix} \times \begin{bmatrix} X_1 \\ \vdots \\ X_8 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \end{bmatrix} \quad (2)$$

In the formula, Y is the endogenous variable vector (composite indices of climate perceptions and climate behaviors, dependent variables); X is the exogenous variable vector (independent variables); β is the path coefficient of the endogenous variables; γ is the path coefficient matrix of the exogenous variables; ε is the residual vector.

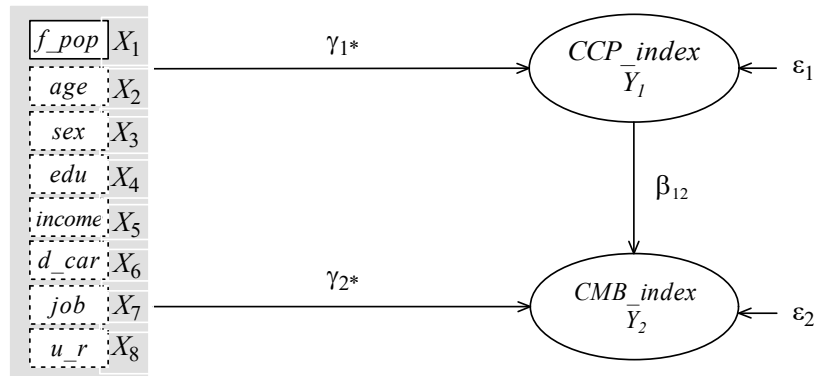


Figure 1 Path Analysis Model for the Climate Behavior Composite Index

(2) Analysis of the population mobility effect on climate mitigation behaviors. This study adopts a logistic regression model by recoding the dependent variable into a binary variable (1=agree, 0=disagree) and performing logistic regression on each specific question of climate behavior one by one, which also makes it easier to interpret the relationship between statistical results and research hypotheses. The mathematical expression is as follows:

$$\text{logit}(p_i) = a_i + b_i \times f_{pop} + \sum_{j=2}^8 c_{ij} x_{ij} + d_i x_{ccb} + \varepsilon_i \quad (3)$$

In the formula, p_i is the probability of "agreeing" with the i th question; b_i is the regression coefficient of the "floating population" dummy variable (f_pop); c_{ij} is the coefficient of the i th question and the j th control variable; x_{ij} is the control variable in Table 3; x_ccb is the climate perception composite index; d_i is the coefficient of the i th question climate perception composite index; ε_i is the residual term.

5 RESULTS ANALYSIS

5.1 Population Mobility Effect on Climate Behavior Composite Index

Table 4 presents the analysis results of the standardized direct, indirect, and total effects of the floating population dummy variable and other control variables on the climate behavior composite index. The path analysis model demonstrates a good fit with the survey data, as indicated by acceptable overall test parameters (R^2) and goodness-of-fit indices (GFI, AGFI, IFI, CFI, RMSEA). Additionally, Cronbach's alpha coefficient confirms the reliability of the survey data. The impacts of other control variables align with findings from previous related studies, affirming the

appropriateness of their selection as controls. The following discussion focuses primarily on the relationship between the floating population and climate behavior.

Empirical results indicate that the floating population dummy variable significantly positively influences both climate perception and the climate behavior composite index, with total effects ranging from 0.10 to 0.23. Specifically, the effect of the floating population dummy variable on the climate perception composite index is 0.23, suggesting that the floating population's climate perception score is 0.23 standard units higher than that of the local population. Given the composite index coding method, a higher score corresponds to more positive climate perceptions, indicating a systematic association between population mobility and climate perception; thus, the floating population demonstrates more favorable climate perceptions. The selectivity and adaptability of floating populations/migrants contribute to their shift towards environmentally friendly cultural perceptions and behavioral patterns[12]. The environmentally friendly behaviors of the floating population may reflect changes in their perceptions[28].

The total effect of the floating population dummy variable on the climate behavior composite index is 0.10, with a direct effect of 0.08 and an indirect effect of 0.02. This signifies that population mobility not only directly promotes climate mitigation behaviors but also indirectly encourages them by altering climate perceptions. Notably, the direct effect of climate perception on climate mitigation behavior is 0.31, while the indirect effect of other factors on climate mitigation behavior through climate perception is 0.11, highlighting the significant mediating role of climate perception in influencing the climate mitigation behavior of the floating population[29].

Overall, population mobility exerts a direct influence on climate behavior, with the floating population displaying climate-friendly characteristics in areas such as energy conservation, emissions reduction, resource conservation, and green travel. However, there is no evidence of climate-friendly preferences among the floating population concerning waste sorting and long-distance travel. Moreover, changes in climate perceptions during the process of population mobility also indirectly affect climate behavior patterns, with the floating population exhibiting climate-friendly behaviors under the combined influence of various socio-economic factors.

Table 4 Analysis Results of Population Flow Effect of Climate Behavior Composite Index

	CCP_index	CMB_index		
		direct effect	indirect effect	total effect
<i>f_pop</i>	0.23 ***	0.08 **	0.02 ***	0.10 *
<i>age</i>	-0.12 *	-0.04	0.01 *	-0.03 *
<i>sex</i>	-0.06 *	-0.04	0.01 *	-0.03 *
<i>edu</i>	0.08*	-0.01	0.00	-0.01
<i>income</i>	0.01	0.05*	0.02***	0.07*
<i>d_car</i>	-0.04	-0.03	0.01	-0.02
<i>job¹</i>	0.07*	0.07*	0.02*	0.09*
<i>u_r</i>	0.05***	0.08*	0.02***	0.10*
mediating effect				
CCP_index		0.31	0.11	0.42
Cronbach' alpha	0.71		0.82	
R ²	0.62		0.63	
Goodness-of-Fit Index (GFI)				0.95
Adjusted Goodness-of-Fit Index (AGFI)				0.93
Incremental Fit Index (IFI)				0.97
Comparative Fit Index (CFI)				0.92
Root Mean Squared Error of Approximation (RMSEA)				0.04
N				1992

Note: 1. Active=1; Not active=0; 2. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

5.2 Population Mobility Effect on Climate Mitigation Behaviors

To further examine whether the impact of population mobility on different climate mitigation behaviors varies, we constructed and tested baseline models (including only independent variables), standard models (including independent and control variables), and extended models (including independent variables, control variables, and the climate perception composite index).

1.Impact on Climate Mitigation Behaviors: The results in Table 5 indicate that, with the exception of long-distance travel (B5), the regression coefficients for the floating population dummy variable in the baseline and standard models are statistically significant for the corresponding dependent variables (B1–B4). In the standard and extended models, the floating population demonstrates a significant positive impact on climate behaviors related to waste sorting, energy conservation and emissions reduction, resource conservation, and green travel, while the effect on long-distance travel remains insignificant. This suggests that the floating population is more inclined towards climate-friendly behaviors in waste sorting, energy conservation, emissions reduction, resource conservation, and green travel compared to the local population.

2.Proactivity in Climate Behaviors: In both the standard and extended models, the regression coefficients for the floating population dummy variable related to energy conservation and emissions reduction, resource conservation, and

green travel are all positive, with incidence ratios exceeding 1.00. This indicates that the floating population is more proactive in these areas than the local population. Interestingly, individual annual income negatively impacts behaviors associated with energy conservation, emissions reduction, resource conservation, and green travel. Given that the average income of the floating population is lower than that of the local population, this negative impact suggests that individuals with lower incomes may be more inclined to adopt daily climate mitigation behaviors. Overall, the climate mitigation behaviors of the floating population align with economic interests and exhibit economically rational motivations.

3.Heterogeneity of Climate Behaviors: Daily car commuters display distinct behaviors regarding energy conservation and emissions reduction compared to green travel. In the baseline and standard models, the incidence rate ratios for the "daily car commuting" variable concerning energy conservation and emissions reduction (B2) are 2.38 and 2.22, respectively, whereas the ratios for green travel (B4) are 0.65 and 0.63. Even with similar climate perceptions, daily car commuters are more accepting of energy conservation and emissions reduction behaviors; however, the likelihood of adopting green travel methods is lower due to conflicts with daily commuting. This heterogeneity emphasizes the importance of considering the feasibility of climate-friendly behaviors across different groups when promoting low-carbon initiatives.

4.Insignificance of Certain Climate Behaviors: Regarding waste sorting (B1), the regression coefficients for the floating population dummy variable are significant in the baseline and standard models but become insignificant in the extended model when controlling for the climate perception composite index. This indicates that, when accounting for climate perception, there is no significant difference in waste sorting behavior between the floating population and the local population. Waste sorting in China entered the legalization stage in 2019, with major cities like Beijing, Shanghai, Guangzhou, and Shenzhen being early adopters of mandatory sorting policies. However, the effectiveness of these policies has been limited[30], often due to inadequate methods and conflicts between policy objectives and public behaviors[31]. As a result, the preference for waste sorting demonstrated by the floating population in the earlier models is overshadowed by the mediating effect of climate perception in the extended model.

Additionally, in the long-distance travel (B5) model, the regression coefficient for the floating population dummy variable is not significant, indicating no meaningful difference in long-distance travel behaviors between the floating and local populations with regard to carbon emissions. It is essential to note that long-distance travel in this context refers to "changing travel destinations due to carbon emission reasons," thus excluding tourism-related long-distance travel. This clarification may explain the lack of significant difference between the two groups regarding long-distance travel.

5.3 Summary

The analysis reveals that both the direct positive effect of the floating population dummy variable on the climate behavior composite index and its indirect effect through climate perception indicate a preference for climate-friendly behaviors among the floating population. This supports the theoretical hypothesis that "there is a systematic relationship between population mobility and climate mitigation behavior."

The floating population exhibits different preferences for various climate mitigation actions. While climate perception partially accounts for differences in behavior, the risk ratios for energy conservation, emissions reduction, resource conservation, and green travel remain higher for the floating population even when controlling for climate perception. This finding reinforces the hypothesis that the floating population possesses climate-friendly behavior preferences. Conversely, waste sorting behavior becomes insignificant after controlling for climate perception, and no significant difference is found in long-distance travel behaviors affected by carbon emissions between the two groups.

The change in climate perception during migration has a positive mediating effect on climate behaviors. The floating population balances economic considerations with environmental impacts in their decision-making regarding climate behaviors. The interplay of climate perception and the economic rationale underlying climate behavior forms the mechanism through which population mobility influences climate action.

6 CONCLUSION AND DISCUSSION

Currently, we are in the initial stages of implementing the "dual carbon" goals, which require not only emission control measures in the production sector but also the exploration and practice of emission reductions in daily life. According to statistics from the United Nations Environment Programme, carbon emissions from residents' daily consumption account for approximately two-thirds of total emissions[32], while China's daily carbon emissions represent about 50% of the total emissions[33]. This proportion is expected to rise with improving living standards. Guiding the public towards a climate-friendly lifestyle has thus become an essential strategy for mitigating climate change. This paper employs survey data based on communication big data to empirically analyze the climate behavior traits of the floating population, offering insights into the mechanisms through which population mobility impacts climate behavior.

1.Overall Findings: The empirical results indicate that the floating population exhibits more climate-friendly behavior patterns compared to the local population. Whether through changes in ideas and concepts during migration or restrictive consumption patterns, population mobility can positively influence climate behavior in the current socio-economic environment. Megacities, as primary destinations for population inflows in China, benefit from the climate-friendly characteristics of the floating population, which hold significant social value for promoting green

lifestyles and fostering societal participation in low-carbon emission reduction.

2. Specific Climate Behaviors: The floating population demonstrates significant climate-friendly tendencies in energy conservation, emissions reduction, resource conservation, and green travel. However, no such preferences are observed in waste sorting and long-distance travel. The mediating roles of climate perception and the economic rationality behind climate behavior decisions serve as mechanisms through which population mobility impacts climate behavior.

3. Policy Implications: The "dual carbon" target policy should account for both macroeconomic feasibility and the rational responses of the public. Policies lacking public support may face challenges, leading to minimal results[2]. For instance, climate tax policies could lead to higher energy prices and increased living costs, often provoking a conservative public response. Therefore, policy formulation and implementation must consider the economic interests of the public[34], seeking a balance between policy objectives and individual concerns. The daily climate mitigation behaviors of the floating population are influenced by economic factors[35], with behaviors that lower living costs being more readily accepted. Thus, targeted social campaigns can be more effective. Changes in travel patterns may have a greater impact on daily life than energy conservation and emissions reduction, which are often easier to adopt. Consequently, when promoting low-carbon and environmentally friendly behaviors, it is crucial to consider the potential effects of such changes on daily living.

4. Future Research Directions: Under the context of China's "dual carbon" goals, climate behavior represents a new research frontier in environmental social science and climate change response. Given the long-term nature of population migration and mobility, it is essential to track and study the intergenerational transmission patterns of the floating population's climate behavior as they become more urbanized and improve their economic status, leading to localized consumption patterns[36,37].

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COMPETING INTERESTS

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Table 5 Logistic Regression Results of Climate Mitigation Behavior

	1 Garbage classification				B 2 Energy saving and consumption reduction				B3 Resource Conservation				B4 Green travel				B5 long-distance travel			
	benchmark k model	standard model	extended model	benchmark k model	benchmark k model	standard model	extended model	extended model	benchmark k model	benchmark k model	standard model	extended model	benchmark k model	benchmark k model	standard model	extended model	benchmark k model	benchmark k model	standard model	extended model
<i>f_pop</i>	1.11 * (0.34)	1.08 * (0.29)	1.07 (0.27)	2.15 ** (0.54)	2.04 ** (0.51)	1.78 * (0.45)	1.56 * (0.67)	1.32 * (0.51)	1.29 * (0.41)	1.90 * (0.76)	1.89 * (0.62)	1.49 * (0.51)	1.23 (0.44)	1.21 (0.32)	1.21 (0.32)	1.07 (0.41)				
<i>age</i>		1.01 (0.0131)	1.00 (0.0122)	1.00 (0.0071)	1.00 (0.0071)	0.98 (0.0081)		1.02 (0.0088)	1.01 (0.0074)		1.01 (0.0061)	1.00 (0.0058)		1.00 (0.0073)	1.00 (0.0073)	1.01 (0.0083)				
<i>sex</i>		1.17 * (0.33)	1.11 * (0.31)	1.43 * (0.34)	1.22 * (0.44)	1.22 * (0.44)		1.32 ** (0.35)	1.20 ** (0.43)		1.63 ** (0.59)	1.54 ** (0.48)		1.21 (0.30)	1.21 (0.30)	1.16 (0.41)				
<i>edu</i>		0.95 * (0.17)	0.91 * (0.16)	1.06 ** (0.22)	1.05 * (0.19)	1.05 * (0.19)		1.07 *** (0.14)	1.03 *** (0.24)		1.09 * (0.31)	1.06 * (0.24)		1.12 (0.23)	1.12 (0.23)	1.11 (0.25)				
<i>income</i>		1.09 (0.32)	1.07 (0.22)	0.71 ** (0.11)	0.81 ** (0.16)	0.81 ** (0.16)		0.79 ** (0.13)	0.82 ** (0.23)		0.82 *** (0.24)	0.79 ** (0.27)		1.34 * (0.57)	1.34 * (0.57)	1.27 * (0.66)				
<i>d_car</i>		0.81 (0.26)	0.80 (0.23)	2.38 *** (0.42)	2.22 *** (0.45)	2.22 *** (0.45)		0.99 (0.32)	0.96 (0.26)		0.65 ** (0.11)	0.63 ** (0.12)		0.79 (0.16)	0.79 (0.16)	0.69 (0.13)				
<i>job</i>	The reference group is "employed"																			
<i>stu</i>		0.77 (0.31)	0.73 (0.35)	0.71 * (0.31)	0.77 * (0.33)	0.77 * (0.33)		0.59 * (0.21)	0.65 * (0.24)		1.78 ** (0.62)	1.57 ** (0.58)		1.21 * (0.44)	1.21 * (0.44)	1.19 * (0.37)				
<i>back</i>		1.01 (0.59)	1.00 (0.51)	1.73 ** (0.99)	1.63 ** (0.75)	1.63 ** (0.75)		1.85 * (1.18)	1.71 * (1.03)		0.98 ** (0.38)	0.95 ** (0.32)		1.23 * (0.81)	1.23 * (0.81)	1.20 * (0.90)				
<i>a</i>		0.93 (0.45)	0.94 (0.42)	1.11 * (0.39)	1.06 * (0.43)	1.06 * (0.43)		1.13 * (0.35)	1.10 * (0.23)		1.23 *** (0.31)	1.19 *** (0.76)		1.25 ** (0.56)	1.25 ** (0.56)	1.17 ** (0.66)				
<i>u_r</i>		1.53 *** (0.98)	1.45 *** (0.81)	0.83 (0.32)	0.81 (0.42)	0.81 (0.42)		1.21 (0.29)	1.20 (0.33)		1.32 ** (0.54)	1.27 ** (0.48)		0.83 * (0.43)	0.83 * (0.43)	0.80 (0.23)				
<i>CCP_inde</i>			1.33 ***		1.27 **	1.27 **			1.23 **							1.12 *				
<i>x</i>																				
<i>N</i>		1992	(0.78)	1992	(0.79)	(0.79)		1992	(0.82)		1992	(0.72)		1992	(0.59)					

Note: 1. The values in brackets are standard deviations. 2. The parameters in the table are odds ratios 3. * p < 0.05; ** p < 0.01; *** p < 0.001.

