

# Exploring Cross-Cultural Learning in Serious Games through Cognitive Strategies

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**Abstract.** Technological advancements are pushing the boundaries of educational exploration, giving rise to innovative teaching models. Among these, serious games have emerged as a popular choice due to their unique blend of interactivity and educational value. Drawing inspiration from the popular board game “Who’s the Spy,” this article proposes the design of a serious game tailored for language education and cross-cultural learning. This game not only offers an engaging and enjoyable experience but also incorporates diverse cultural elements, enabling learners to enhance their language skills and cross-cultural awareness in a relaxed atmosphere. At the same time, this article will also explore the application of cognitive strategies in serious games, helping learners to organize game content more effectively through strategies such as rehearsal, elaboration, and organization, to enhance learning effectiveness. Through the design and implementation of this serious game, it hopes to provide learners with a novel learning experience that seamlessly integrates language, culture, and technology.

**Keywords:** Cross-cultural Learning; Serious Games; Cognitive Strategies.

## 1. Introduction

In the era of rapidly advancing globalization, cross-cultural learning has emerged as a pivotal aspect for enhancing personal competitiveness and adaptability. Serious games, as an innovative educational approach, offer new possibilities for cross-cultural learning through their distinctive interactivity and immersive experiences. This article endeavors to delve into the cognitive strategies of cross-cultural learning within the context of serious games. It scrutinizes the practical application of strategies such as rehearsal, elaboration, and organization within game design, while highlighting their promotional effects on learners’ cross-cultural understanding, linguistic proficiency, and cognitive capabilities.

### 1.1 Implications of Serious Games

Constrained by geographical and economic factors, many students rely primarily on classroom instruction for cross-cultural learning. However, this approach often lacks diversity, interaction, and immersive language experiences. In response to these limitations, serious games have emerged as a promising educational tool that can offer a flexible and efficient technique to traditional classroom settings. The serious game developed in this study can be designed for offline use if needed, providing learners with convenient and engaging interactive experiences in any setting. This innovative approach not only enhances learners comprehension and adaptability to diverse cultural contexts but also fosters the development of cross-cultural awareness and linguistic proficiency. Additionally, the application scope of this serious game extends beyond cross-cultural learning, encompassing areas such as vocabulary acquisition, discourse communication, and other linguistic domains. By integrating various learning objectives and content, the game framework can be tailored to provide personalized learning experiences that cater to the diverse needs of learners.

### 1.2 Cognitive Strategies and Serious Games

Within the domain of educational psychology, cognitive strategies occupy a pivotal role in enhancing the efficiency and quality of learners’ information processing. These strategies, often tailored to the unique needs of individual learners, represent a collection of methods and techniques designed to optimize cognitive functions. While there exists a degree of variance in the classification

of cognitive strategies across various studies, several core components, including rehearsal, elaboration, and organization, consistently emerge as essential for declarative knowledge acquisition. Serious games, alternatively known as educational games or applied games, stand at the forefront of innovative educational technologies. These applications leverage the engaging nature of gaming to achieve educational, training, or simulation objectives. By integrating game mechanics with educational content, serious games offer a dynamic and interactive learning experience that surpasses the limitations of traditional classroom settings.

In this study, the author proposes the development of a serious game, inspired by the classic board game “Who is the Spy?” and aptly named “Coswords.” This game is designed to facilitate cross-cultural learning by challenging players to describe words using cultural elements and background knowledge, while maintaining the suspense and excitement of the original game. Players must cleverly hint at their companions without revealing their identity to the “spy”, testing not only their linguistic skills but also their understanding and application of different cultures. The integration of cognitive strategies into “Coswords” presents a unique opportunity to create a rich and immersive learning experience. Through carefully crafted game mechanics and scenarios, players are presented with cognitive challenges that require them to employ various strategies to succeed. This not only enhances the educational value of the game but also provides players with valuable practice in applying cognitive strategies in real-world contexts. Furthermore, the analysis of user data and behaviors within serious games offers insights into learners’ motivation, engagement, and cognitive processes. This information can be leveraged to further optimize game design and educational content, tailoring it to the specific needs and preferences of individual learners. By doing so, serious games have the potential to revolutionize cross-cultural learning, making it more engaging, effective, and accessible to a wider range of learners.

## **2. Cross-Cultural Elements in the Design of “Coswords”**

### **2.1 Cultural Symbols and Scenarios**

The seamless integration of cultural symbols and scenarios within game design serves as a major aspect in enhancing cross-cultural experiences. By designing scenarios that exude unique cultural nuances, such as traditional architectures, festive celebrations, and customary practices, “Coswords” offers players an immersive opportunity to experience the diverse atmospheres and characteristics of various cultures. For instance, a scenario set against the backdrop of ancient Chinese imperial palaces can be crafted, allowing players to marvel at the profound essence of Chinese culture through the intricate and magnificent architectural landscapes. Alternatively, a scenario inspired by the vast African savanna can be envisioned, exhibiting the captivating charm of African culture through its extensive natural beauty and primitive tribal cultures.

Moreover, the utilization of rich visual and auditory elements plays a significant role in representing the symbols and representations of diverse cultures. These elements, encompassing costumes, music, cuisine, and more, contribute to creating a profound cultural ambiance. Costumes, for instance, can be designed to reflect the distinct cultural features of various countries, enabling players to dress in traditional attire and appreciate the aesthetic beauty of different cultural costumes. Similarly, musical elements from diverse cultural backgrounds can be incorporated through meticulously crafted background music and sound effects, providing players with an immersive auditory experience that reflects the melodies of various cultures.

Furthermore, “Coswords” ensures that different themes are accompanied by corresponding alternative words for learning purposes. This approach ensures a seamless alignment between the cultural scenarios and the learning content, enhancing the educational value of the game while maintaining its entertainment aspect. By adopting such an academic and authentic approach in the integration of cross-cultural elements, “Coswords” aims to provide players with a rich and immersive cross-cultural gaming experience that not only entertains but also educates.

## 2.2 A Multi-Language Learning Module

Language acquisition is an essential prerequisite for effective cross-cultural communication. In the context of serious games, the integration of a multi-language learning module holds significant potential in enhancing players' linguistic proficiency and intercultural communicative abilities. This module must be designed with academic rigor and cultural authenticity to ensure optimal learning outcomes. Firstly, the module should incorporate a diverse range of learning activities tailored to different language levels and learning objectives, including vocabulary acquisition and conversational simulations. By providing a graduated approach to language learning, the module can cater to players with varying linguistic backgrounds and skill levels. Moreover, the utilization of authentic cultural content is crucial in fostering a immersive learning experience. This can be achieved through the inclusion of culturally relevant scenarios, dialogues, and visual representations. By exposing players to authentic cultural elements, the game can foster a deeper understanding and appreciation of diverse cultures. Furthermore, the integration of advanced language technologies such as real-time translation and speech recognition can greatly enhance the learning experience. These technologies can facilitate cross-language communication, enabling players to interact and collaborate in multiple languages. Additionally, they can provide instant feedback on players' language use, aiding in the identification and correction of linguistic errors. Lastly, the implementation of a language and cultural achievement system is essential in motivating players to engage with the learning module. This system can award achievements and rewards based on players' progress in language learning and cultural understanding. By recognizing and acknowledging players' efforts and achievements, "Coswords" can foster a sense of accomplishment and encourage continued engagement with the learning process.

The design of a multi-language learning module in serious games requires a balance between academic rigor, cultural authenticity, and engaging gameplay. By carefully considering these aspects, game developers or educators can create a powerful learning tool that effectively promotes language acquisition and cross-cultural communication.

## 2.3 Mechanisms for Cultural Conflicts and Resolution

Cultural conflict is an inevitable aspect of cross-cultural communication. Incorporating mechanisms for cultural conflicts and their resolution within serious games allows players to immerse themselves in and learn how to navigate such differences and clashes. These games can devise challenging tasks or scenarios that prompt players to utilize their acquired knowledge to analyze and resolve cultural conflicts. Additionally, "Coswords" can incorporate a feature that enables players to customize their vocabulary, permitting them to add terms related to diverse cultures based on their individual interests and requirements. This vocabulary can encompass a wide range of domains, including history, art, technology, customs, and more, enriching the game's content with diversity.

The replay (post-round review and discussion) session is also a crucial part of game design, providing a platform for players to reflect and learn. Firstly, the replay session helps players objectively evaluate their own performance. In this session, players can review their decision-making process in the game, analyze which practices are effective and which may be the cause of mistakes. Through continuous self-reflection, players can gradually improve their game skills, such as interpreting vocabulary more accurately, hiding their identity more skillfully, or detecting others' flaws more keenly. Players can share their understanding of vocabulary, interpretation of others' behaviors, and views on game strategies. This exchange helps broaden players' horizons, allowing them to think about problems from different perspectives, thereby enriching their game experience and knowledge system. In addition, it also helps optimize game sessions and enhance the overall game experience. Through discussion, players can discover possible problems and deficiencies in the game, such as unreasonable vocabulary selection and unclear rule explanations. For these problems, players can propose improvement suggestions to make the game more complete and interesting.

Besides, the establishment of a player community and a vocabulary sharing function can be integral to the gaming experience. Players can leverage this platform to share their self-designed

vocabulary, learning insights, and cross-cultural communication experiences, fostering interactions and exchanges with other players. This not only fosters cooperation and competition among players but also transforms the game into a dynamically evolving repository of cross-cultural vocabulary.

It is crucial to establish effective feedback and update mechanisms. Games should actively encourage players to provide feedback on the cultural conflicts they encounter within the game. Based on this feedback, the game content should be promptly adjusted to adapt to the ever-changing cultural landscape and player needs. By doing so, serious games can not only serve as platforms for learning and practicing cross-cultural communication skills but also evolve and stay relevant with the times.

### **3. Cognitive Strategies in “Coswords”**

#### **3.1 Rehearsal Strategy**

The rehearsal strategy, a fundamental cognitive tool employed by learners during the memory process, aims to retain and enhance information retention. Through techniques such as repetition, recall, and recognition, this strategy solidifies information in short-term memory and facilitates its transition to long-term storage. This approach holds significant importance in educational settings, particularly when addressing intricate or abstract concepts (Gagné, R. M. , 1999).

In “Coswords,” players are required to articulate the words in their possession with clarity and coherence. The rehearsal strategy serves as a valuable asset, assisting players in better retaining and describing these words, thereby ensuring the accurate transmission of information. Players can deepen their understanding and memory of words by repeatedly verbalizing them. Furthermore, they can verify or refute their own assumptions by listening to the retelling of other players. Beyond the words themselves, players can also recite game scenarios or clues, aiding themselves and their compatriots in the reasoning process.

The rehearsal strategy constitutes a crucial element of this gaming mechanism. Players must accurately comprehend and memorize their vocabulary, subsequently expressing it verbally to ensure their teammates’ understanding and recognition of their identity while confounding their opponents. By consistently repeating and comparing the descriptions of fellow players, individuals can gain a deeper understanding of vocabulary meanings, thereby enhancing their chances of success within the game. Rehearsal not only aids in memory consolidation but also hones players’ linguistic expression and logical reasoning abilities. Through repeated recitation and imitation of authentic linguistic expressions, learners can refine their oral fluency and accuracy, ultimately strengthening their linguistic application capabilities. By reciting observed behaviors, expressions, or language, players can construct a more comprehensive mental picture of the game, allowing for more precise deductions regarding the identity of undercover players.

#### **3.2 Elaboration Strategy**

Elaboration strategy is primarily focused on connecting new information with preexisting knowledge, thereby enhancing the significance of the new information. Through the employment of techniques such as metaphor, analogy, and reasoning, learners integrate fresh knowledge into their cognitive structures, deepening their comprehension and retention of the new information. This approach not only assists learners in developing a comprehensive knowledge system but also enhances their problem-solving capabilities (Xin Tao et al., 2002).

In “Coswords,” players can leverage association and imagination to create unique descriptive representations for the vocabulary at hand. This not only adds an element of fun to the game but also facilitates better understanding and memory retention for other players. Especially when dealing with vocabulary that involves cross-cultural elements, players can delve into the cultural significance and historical backdrop using elaboration strategies. This approach not only enhances the depth of the gaming experience but also fosters understanding and respect for diverse cultures. For instance, when encountering terms related to Halloween and Easter, players can draw on their cultural repertoire to

describe similar festivals such as Qingming or Zhongyuan, and then gradually introduce the new knowledge, achieving the desired effect of analogy and reasoning.

Elaboration strategy emphasizes the deep understanding and processing of information. In the realm of serious games, these strategies can be applied through case studies, cultural comparisons, and other methodologies. Games can be designed to incorporate scenarios and case studies related to cultural differences and conflicts. Players are required to analyze these cases during gameplay, gaining insights into behavioral patterns and modes of thinking within different cultural contexts, thereby enhancing their comprehension of cultural nuances and similarities.

### 3.3 Organization Strategy

Organization strategy primarily focuses on integrating old and new knowledge to create a systematic knowledge structure. Through methods such as categorization, sequencing, and establishing network relationships, learners organize dispersed information into an orderly whole, facilitating its retrieval and application. The utilization of organization strategies aids learners in grasping the inherent connections and patterns within knowledge, thereby enhancing learning efficiency (Zhang Qinglin & Yang Dong, 2002).

In “Coswords,” players are required to consolidate diverse information to deduce the identity of the “spy”. Organization strategies assist players in integrating scattered clues and information to form a coherent chain of reasoning. By establishing a clear information framework, players can analyze and solve problems more efficiently. For instance, consider vocabulary related to Chinese culture, such as “the Great Wall,” “Peking Opera,” “the Forbidden City,” and “pandas.” Players can categorize these terms under the theme of “Chinese Culture” and emphasize their commonalities and unique characteristics during descriptions.

The application of organization strategy in serious games is primarily evident in the organization and summation of knowledge. Games can incorporate tools like knowledge maps or mind maps to aid players in organizing disparate cultural knowledge and information into a coherent whole. These tools can be dynamically updated and refined as the game progresses, reflecting players’ comprehension and mastery of cultural knowledge. Additionally, games can design challenges or tasks that require players to synthesize and apply their acquired knowledge, serving as a means to assess and reinforce the effectiveness of their organization strategies.

## 4. The Practice of “Coswords” among English Majors

This part explores the integration of “Coswords” into the educational framework for English major students, aiming to foster their cross-cultural cognitive abilities and linguistic proficiency in a fun and engaging environment. In this game, 16 junior-level English major students were selected as participants, with the author serving as the game host. Prior to the experiment, a selection of words pertinent to cross-cultural knowledge was carefully elected and distributed to the students to familiarize them with the contextual background and meanings. Throughout the experiment, several rounds of the offline “Coswords” were conducted, paper cards and translation software were used in this experiment. In each round, students took turns describing the word they drew in English, with the assistance of mobile phone translation software permitted. This exercise not only tested their linguistic proficiency but also challenged their real-time translation and cross-cultural communication skills.

Observations during the experimental process revealed a high level of engagement among the students. In the game, students took turns to speak and made judgments after listening to other players’ statements. After the entire round, students engaged in an intense replay session, discussing the interesting statements and novel knowledge points. They made adjustments for their next round, constantly familiarizing themselves with the rules of the game, attempting to reveal their identity through descriptive language. Post-game feedback indicated that students not only received intensive training in oral and listening skills but also gained a deeper understanding of the fundamental

meanings of the assigned words and developed an appreciation for the extended meanings of the vocabulary.

Upon questioning, all students can grasp the basic meanings of the vocabulary they played with. However, it was noted that some students exhibited excessive reliance on translation tools during the game. Additionally, the need to mobilize multiple linguistic skills within a limited time-frame led to nervousness and anxiety among certain students, affecting their performance. But this also underscores the importance of considering the cognitive load associated with cross-cultural learning, prompting educators to explore strategies that balance fun and effectiveness.

## 5. Conclusion and Future Prospects

This study explores the integration of cognitive strategies and cross-cultural elements in serious game design, with the aim of offering a new and immersive cross-cultural learning experience for educators and learners alike. By integrating cognitive strategies such as rehearsal, elaboration, and organization, along with diverse cultural elements and multi-lingual learning modules, this article aspires to create a serious game that is both engaging and edifying, fostering the enhancement of linguistic proficiency and cross-cultural awareness in a pleasant and stimulating environment. Peering into the future, we remain committed to further exploring the application and advancement of serious games in the realm of cross-cultural learning. On one front, we endeavor to refine our game design frameworks and cognitive strategy implementation methods, aiming to optimize the educational impact and user experience. On another, we actively seek collaborations and exchanges with educational institutions, businesses, and other stakeholders to broaden the reach and implementation of serious games. Furthermore, it is worth exploring in depth the validation of cognitive strategies in serious games, the measurement of learners' cognitive load, as well as the evaluation of cross-cultural capabilities. With the relentless advancement of technology and the deepening of research, we believe that serious games will emerge as a pivotal tool in cross-cultural learning, playing a pivotal role in nurturing individuals with a global mindset and proficient in cross-cultural communication.

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