Designing and Evaluating a Card Game to Support High School Students in Applying Their Knowledge of World History to Solve Modern Political Issues

Ryohei Ikejiri
ikejiri@i-timemachine.net
Graduate Student
The University of Tokyo
Tokyo, Japan

Mio Tsubakimoto
mtsubaki@fun.ac.jp
Specially Appointed Assistant Professor
Future University Hakodate
Hokkaido, Japan

Toru Fujimoto
tfujimt@iii.u-tokyo.ac.jp
Research Assistant Professor
The University of Tokyo
Tokyo, Japan

Yuhei Yamauchi
yamauchi@iii.u-tokyo.ac.jp
Associate Professor
The University of Tokyo
Tokyo, Japan

ABSTRACT

Although researchers have pointed that studying history can serve as a significant source for cultivating alternative solutions to confront contemporary social problems, effective learning methods to achieve that goal have not been produced. This paper analyzes what types of learning methods can successfully be used to support high school students in applying their knowledge of policies in world history to propose potential policies that address modern political issues. We designed a card game using a deck of cards that describes the policies that various famous figures in world history have proposed to improve economic situations, the policies' historical contexts, and why and how they were implemented. We also designed a game board with a map of Japan to foster connections between historical policies and students' preexisting knowledge, making references to historical learning and cognitive psychology. We examined the effectiveness of the card game with thirty-six high school students. We first compared the students' pre- and post-test scores concerning their knowledge of policies that address modern Japan's economy. Next, we conducted rounds of protocol analysis to learn how the students interacted while playing the game. The comparison of test scores indicated that students named more policies that stimulate Japan's economy ($p<.01$) after playing the game. In particular, they named more policies concerning cultural and social perspectives. The protocol analysis demonstrated that the game rules helped students place historical policies into their specific modern contexts.

Keywords: Historical Learning, Game-Based Learning, Analogy, Collaborative Learning, Transfer of Learning

INTRODUCTION

It has been proven that an analogy prompts more creative learning, and there has also been growing interest in historical analogy. For example, with respect to the effect of historical analogy, Lee (2005) insists that learning about historical causal relationships assists modern people in predicting social changes. More concretely, David (2002) suggests that history should not be only about the past and that history can provide alternative solutions to modern problems that have similarities. Actually, often, there are cases in which American politicians apply historical lessons when making political judgments about social problems or forming diplomatic policies that cannot be judged based on individual experience

(Abbott & Adler, 1989). Thus, studying history can serve as a significant source for cultivating alternative solutions to confront contemporary social problems.

In the past, while historical learning has been viewed as the ability to memorize specific events and the dates on which they occurred, recent researchers have come to insist that historical knowledge must play a role in learners' practical life and that the ability to acquire a sense of historical analogy is important in historical education. In Japan, for example, the government's teaching guidelines for high school education (2009) require the fostering of the ability to apply historical knowledge to modern problems.

Although there has been this growing interest in historical analogy, effective learning methods to achieve that goal have not been devised. As is evident from Drie and Boxtel's (2008) excellent review of significant research in historical learning, previous studies in this field have provided many learning methods: discussions based on many sources, use of digital archives, thinking and writing with multimedia tools, among others. However, these studies have failed to consider students' ability to use learning about the past as a means to solve present and future problems (Ryohei, 2011).

RESEARCH QUESTIONS

The research question in this paper is what types of learning methods can be used successfully to support high school students in applying their knowledge of policies in world history to propose potential policies that can address modern political issues. In addition, an evaluation of this method is conducted for high school students. The theme of this lesson is "activating Japan's economy" according to *a usable historical framework* (Lee, 2005) that provides an overview of long-term change patterns, not a mere outline skimming a few peaks of the past, that can bind historical causal relationships and modern ones.

RESEARCH DESIGN

Design Principles

There are three design principles that are important in supporting high school students in applying their knowledge of policies in world history to propose potential policies that can address modern political issues.

The first principle focuses on providing cards that describe various historical policies that improved economic situations, along with a format of "problem," "solution," and "result," and requiring students to apply those as analogies to a situation that would improve modern Japan's economy. As is evident from Poze (1977), remote analogies are crucial to the creative problem-solving process. Also, Sawyer (2008) insists that a conversation among people from different backgrounds prompts the process of creative analogy. Moreover, in cognitive science, Sagard and Holyoak (1994) reveal that dividing information into "problem," "solution," and "result" can promote the transfer of knowledge.

The second design principle involves noting differences between historical contexts and modern ones. As is evident from Mansilla (2000), students who can successfully apply historical knowledge to modern society have the ability to compare two cases and identify the differences between them. Also, in cognitive science, Kurtz, Miao, and Gentner (2001) reveal that the ability to note the substantive differences and similarities between different contexts both in the target object and base one can effectively promote the transfer of knowledge.

The third design principle concerns constructing the learning process through game-based learning, which involves two students versus two students. It has been pointed out that historical analogy often causes the misuse of analogy, and thus needs careful discussion (Fisher, 1970). Moreover, historical analogy is a complex process and requires gradual learning steps. Game-based learning is an effective method to address these problems because playing a game involves participating in conversations related to the game, including the multiple perspectives of the players who are all working toward the same goal (Duke, 1975). Also, because the game system makes many components interactive, the players must devise micro-creative actions to achieve a single goal (Salen & Zimmerman, 2011). Therefore, the game should be composed of two students versus two students—two students to apply historical relationships to modern ones and two students to check the applied policies.

Design

<u>Design of game tools</u>

First, we designed 16 cards that describe the policies that various famous figures in world history proposed to improve economic situations. The content of each card consists of 3 sentences: the historical context of the policy ("problem"), how the policy was implemented ("solution"), and what the result was ("result"). Moreover, the 16 cards are divided into four categories: political policies (4 cards), economic policies (4 cards), cultural policies (4 cards), and social policies (4 cards), all of which were connected to the issue of improving economic situations. The policies are selected according to various eras and world regions, and all the historical individuals are popular figures in Japan's world history textbooks. Figure 1 shows a sample of the card. It corresponds to the first design principle.

We also designed a game board with a map of Japan to foster connections between historical policies and students' pre-existing knowledge. The Japanese map is divided into eight regions. It corresponds to the second design principle.
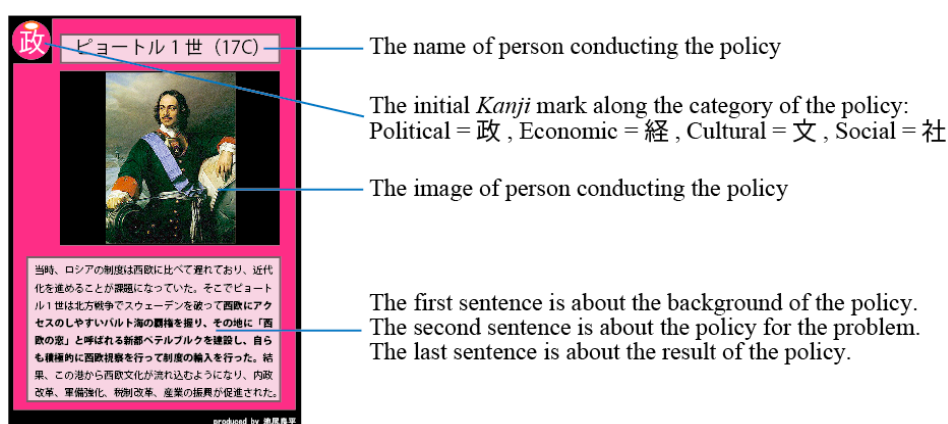

Figure 1. Example of a card used for historical analogy

<u>Design of game rules</u>

Next, we designed game rules for applying historical policies to modern ones using the following game tools. This game is named "*CHRONOFUL*," and the goal is to generate many policies that will improve Japan's economic situation through historical analogy, thereby addressing Japan's economic problems. This is a game based on taking turns, and the players are divided into pairs. Points can be won in two ways: One point is given for each region of Japan (1–3 points are given for each region's GDP), when students apply their knowledge of policies in world history to propose potential policies to address modern political issues. The other point is given for improving the policies that are generated through historical analogy (0–2 points are given according to the quality of both teams' discussions). The game ends when either team has changed the historical policies to modern ones in all four categories. The team that gets more points is the winner. This game design corresponds to the third design principle.

This game is composed of actions that are based on taking turns, and one turn consists of four steps. After *janken*, either team can take actions. After that, the other team can do the same actions. After one team has finished its turn, each team draws two new cards, and this process is repeated until the end. Figure 2 describes the game setting and the process of the game.

(1) Choosing a historical policy for analogy

Either team chooses one historical card from the two cards in their hand to play the game using historical analogy. In this step, a policy is still historical. This phase corresponds to the first design principle.

(2) Applying the historical policy to a modern context

Next, the teams must present a historical policy and the policy they have generated for improving a region's economy in modern Japan through a card to the opposing team. At this time, they must include their perspectives on the characteristics of the region. In this step, a policy is changed from a historical to a modern one. This phase corresponds to the first design principle.

(3) Indicating differences between the historical context and the modern one

Next, the opposing team can indicate the differences between the historical context and the modern one. In this step, they give a hint so as to provide a better analogy. This phase corresponds to the second design principle.

(4) Improving the policy

Next, the opposing team can improve the policy such that it is more suitable to a modern context. In this phase, a historical policy is changed to one that is more suited to a modern context. This phase corresponds to the second design principle.
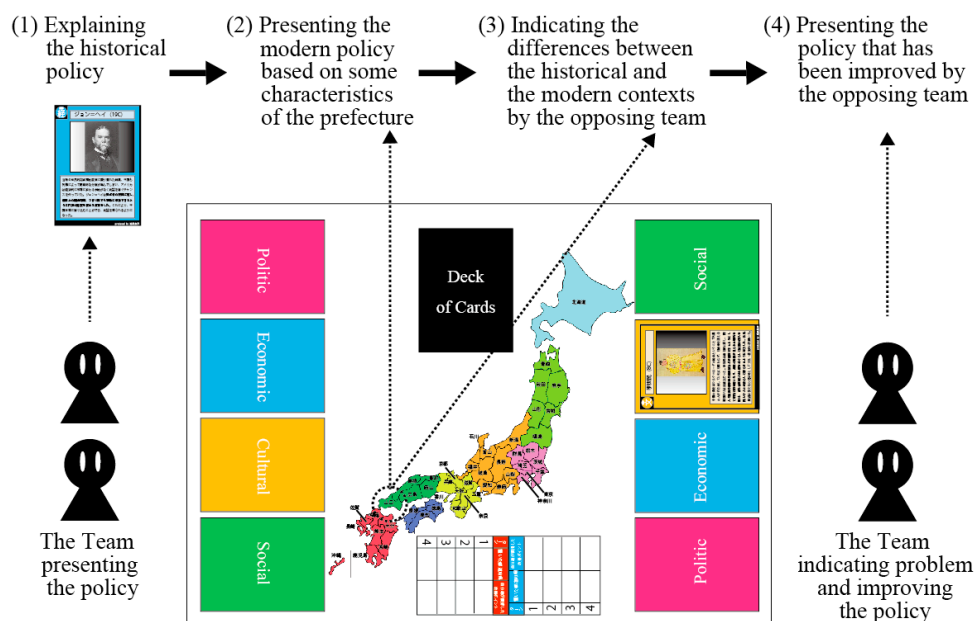

Figure 2. Game setting and the process of the game

Evaluation

We examined the effectiveness of the card game with 36 high school students. First, we compared the students' pre- and post-test scores concerning their knowledge of policies that address modern Japan's economy. In the test, students had to write down as many policies as possible that address modern Japan's economy within 10 minutes. The number of policies was counted in a group unit (N = 9). In addition, the policies were labeled according to four categories: political policies, economic policies, cultural policies, social policies, and the number in each category in the pre- and post-tests was analyzed.

Next, we conducted rounds of protocol analysis to demonstrate whether the game rules helped students to place historical policies into their specific modern contexts and learn how the students interacted while playing the game. We expected that the policy would be changed from a historical one to a modern one gradually along the (1)–(4) steps; thus, we analyzed each turn (N = 63) in regard to whether the policy the students presented in (2) and (4) added to a peculiar word in modern Japan (ex. "automotive industry in Toyota "). Moreover, we analyzed the factors of the process of success.

RESULTS

The comparison of the test scores indicated that the students were able to name more policies that would stimulate Japan's economy ($p < .01$) after they played the game. Table 1 shows the results of a Wilcoxon matched-pairs signed-rank test. Moreover, interesting results were obtained by analyzing the policies labeled in each category. In the pre-test, the students tended to name more policies related to political and economic perspectives than cultural and social ones. However, in the post-test, the number of policies concerning cultural and social perspectives increased significantly ($p < .01$). This means that this game developed students' ability to generate policies that would improve modern Japan's economy, especially in terms of cultural and social perspectives with which they were not very familiar before playing the game.

Moreover, the protocol analysis demonstrated that the game rules helped the students to classify historical policies into their specific modern contexts. They could add particular words in modern Japan in 63 turns (= 100 %) in (2) phase and 45 turns (= 71 %) in (4) phase. This means that this game could gradually support the process of performing a historical analogy. The results of analyzing how the students interacted in terms of success showed that the process became successful when the theme of the policy that they addressed was familiar or when they referenced the cards and the map repeatedly.

To summarize, this research provided a game method for supporting historical analogy and verified its effect. In future research, the following question is the most important: How we can design a learning environment that is suitable to the context of students' lives?

Table 1. Results of Wilcoxon matched-pairs signed-rank test

| | Median | | Wilcoxon matched-pairs signed-rank test | | | | | |
| | | | Negative Rank | | Positive Rank | | Ties | |
$N = 9$	pre-test	post-test	N	Sum of Ranks	N	Sum of Ranks	N	Z
All Policies	17	28	0	0.0	9	45.0	0	-2.668 **
Political Policies	4	7	2	3.5	6	32.5	1	-2.038
Economic Policies	7	8	6	35.5	3	9.5	0	-1.547
Cultural Policies	3	8	0	0.0	9	45.0	0	-2.668 **
Social Policies	2	7	0	0.0	9	45.0	0	-2.668 **

**$p < .01$; Wilcoxon matched-pairs signed-rank test is conducted by pre-test - post-test

REFERENCES（There is no need to check）

Abbott, C., & Adler, S. (1989). Historical Analysis as a Planning Tool. *Journal of American Planning Association*, 55(4), 467-473.

David J. Staley. (2002). A History of the Future. *History and Theory, Theme Issue,* 41, 72-89.

Duke, R. (1975). *Gaming: The Future's Language*. New York: John Wiley & Sons Inc.

Drie, V. J., & Boxtel, V. C. (2008). Historical Reasoning: Towards a Framework for Analyzing Students' Reasoning about the Past. *Educational Psychology Review*, 20(2), 87-110.

Fisher, H. D. (1970). *Historians' Fallacies Toward a Logic of Historical Thought*. New York: Harper and Row, Publishers.

Holyoak, K., & Thagard, P. (1980). *Mental Leaps: Analogy in Creative Thought*. Massachusetts: The MIT Press.

Kurtz, K.J., Miao, C. H., & Gentner, D. (2001). Learning by Analogical Bootstrapping. *The Journal of The Learning Sciences*, 10(4), 417–446.

Lee, P. (2005). Historical literacy: theory and research. *International Journal of Historical Learning, Teaching and Research*, 5 (1), 25-40.

Mansilla, V. (2000). Historical Understanding Beyond the Past and into the Present. In Stearns, N. P., Seixas, P. & Wineburg, S. (Eds.), *Knowing Teaching and Learning History: National and International Perspectives*. New York: New York University Press.

Ministry of Education, Culture, Sports, Science and Technology – Japan. (2009). *Koutou Gakkou Gakushuu Sidouyouryou Kaisetsu*. Tokyo: Kyouiku Shuppan.

Poze, T. (1983). Analogical Connections the essence of creativity. *Journal of Creative Behavior*, 17, 240-258.

Ryohei, I. (2011). Rekishi no Ingakannkei wo Gendai ni ouyousuru Chikara wo ikuseisuru Card Game Kyozai no Design to Hyoka. Nihon Kyouiku Kougakkai Ronnbunshi, 34(4), 375-386.

Salen, K., & Zimmerman, E. (2003). *Rules of Play: Game Design Fundamentals*. Massachusetts: The MIT Press.

Sawyer, K. (2008). *Group Genius: The Creative Power of Collaboration*. New York: Basic Books.