

Designing and Evaluating Game-based Learning to Encourage High School Students to Organize Historical Knowledge in Relation to Substantive Concepts

Hiroaki Aikawa
 Tokyo Metropolitan Ogikubo High School
 Hiroaki_Aikawa@education.metro.tokyo.jp

Ryohei Ikejiri
 The University of Tokyo
 ikejiri@iii.u-tokyo.ac.jp

Abstract: In this study, we present a game-based learning method that will encourage high school students who are learning Japanese history to organize their historical knowledge in relation to substantive concepts and evaluate the effects. We designed, which is called historical person poker and presented in a classroom setting to high school students. As a result of comparing between the mean of pre-test and post-test, this game is effective for organizing knowledge about historical persons in relation to substantive concepts.

Keywords: Game-based Learning, Active Learning, History Education, Historical Thinking, Card Game

INTRODUCTION

There is growing interest in cultivating historical thinking in the context of history education. To help students cultivate historical thinking, teachers need to guide them to develop and organize their historical knowledge in relation to substantive concepts, such as feudalism, which are necessary for historical thinking (Drie & Boxtel, 2008). However, only a few educational methods are effective for achieving this goal. In this study, we designed a learning method that will encourage high school students who are learning Japanese history to organize their historical knowledge in relation to substantive concepts; further, we evaluate the effects of the use of this method.

DESIGN

We focus on the historical knowledge of historical figures from modern Japanese history and use the card game to find the similarity between two figures because the game system makes many components interactive (Salen & Zimmerman, 2011; Ikejiri *et al.*, 2012).

The game is called “historical person poker.” Its rules are similar to those of a form of poker called “Texas hold’em” (Table 1 and Figure 1). On these cards, which we developed, there are no numbers, but instead, different historical figures. For each figure, there are certain listed characteristics, including substantive concepts related to the specific individuals (Figure 2). It is a competitive game, and players can obtain points by finding similarities between the three cards they are dealt. They can draw

any cards up to three times, and construct sets of five cards, including two cards already face up. They can

Table 1. How to play the game

1	A student who acts as a referee deals three cards to players A and B. The referee puts two cards down, face up, in the center of the table. Each player considers and talks about what kind of poker hand they are constructing.
2	Players can draw any cards up to three times from the deck.
3	Each players explains their poker hand to the referee and other players when the exchange is over.
4	If the players are dissatisfied with the other’s hand, they make an objection to the referee. The referee can be dismissed if there are any doubts about the hand.
5	Finally, the referee confirms the hand of both players, based on the hand list. The hand of both players are given any points. The referee decides the winner based on who has a higher point count..
6	The players and the referee hold meeting for reviewing the game.

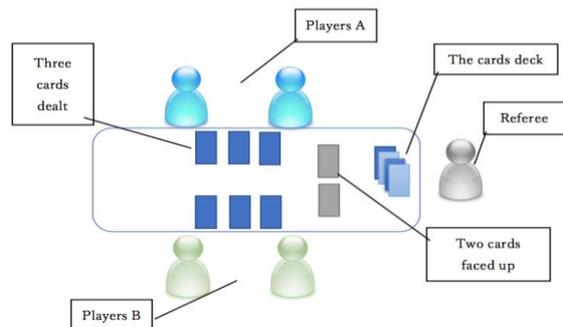


Figure 1. The scene of playing game

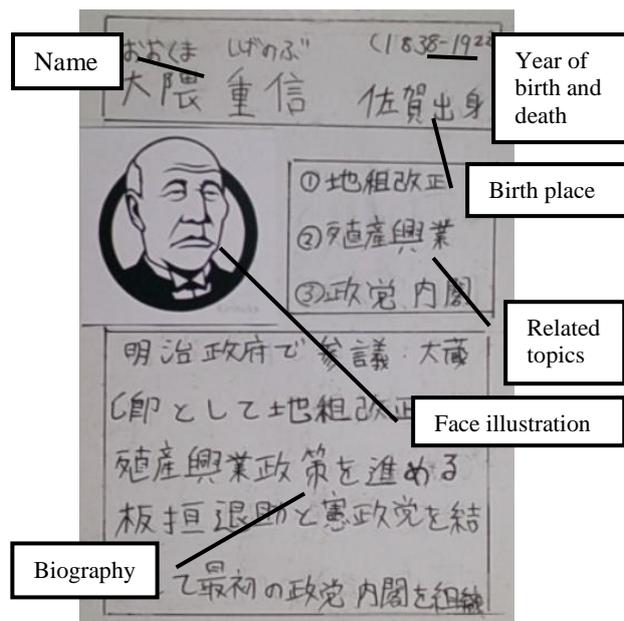


Figure 2. Example of a card

get points if they find similarities related to substantive concepts. The referee confirms the hand of both players based on the hand list and decides the winner based on who has a higher point count. Figure 2 is an example card of “historical person poker”.

EVALUATION

The idea of the game was presented in a classroom setting to 26 high school students who were studying modern Japanese history in 2016, and we collected pretest and post-test data from only 19 students. In both tests, the students were provided the same 16 cards and were required to identify as many similar pairs of historical figures as they could within 10 minutes.

The similarities were coded in general terms (literary person, prime minister) or as concrete words related to the historical context, such as Taisho democracy and Satcho Alliance. We compared the result between pre-test and post-test, especially focusing on the number of similarities associated to concrete words related to historical contexts, meaning substantive concepts.

RESULT & DISCUSSION

The pre-test mean was 3.58 (SD = 1.64) and the post-test mean was 4.47 (SD = 1.43). The results of t-test of pre- and post- test scores confirmed a significant increase ($t[18] = 2.39, p < 0.05$). The effect size (Cohen's d) was medium (0.58). Moreover, focused on the number of similarities found that associated to concrete words related to historical contexts, the pre-test mean of that was 1.11 (SD = 1.05) and the post-test mean was 1.68 (SD = 1.42).

Table 2. The result of pre- and post- test

	Pre-test Mean (SD)	Post-test Mean (SD)	Effect size (cohen's d)
the number of similarities	3.58 (1.64)	4.47 (1.43)	0.58
the number of similarities related to historical contexts	1.11 (1.05)	1.68 (1.42)	0.46

The results of t-test of pre- and post- test scores confirmed a significant increase ($t[18] = 2.25, p < 0.05$). The effect size (Cohen's d) was medium (0.46).

This shows that historical person poker was effective for organizing knowledge about historical persons in relation to substantive concepts. For example, one of the students in this class answered that the similarity between Ogai mori and Akiko Yosano was just “Literary” in the pre-test. However, in the post-test, he answered that a common point of theirs was “Literary in MEIJI period”. It shows that the game might give some students more specific information, and enhance the ability to relate substantive concepts.

However, this card game is limited only to the historical person. Future work is adding new cards such as historical events or art work that may promote more important combinations to cultivate historical thinking more deeply.

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