Serious Fun: Game Design to Support Learning about the Surrender of Singapore

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Chronology, or putting past events in temporal order, is a starting point for making sense of the past (Seixas & Morton, 2013). However, sequencing the past into chronological order requires more than the memorization of events and their dates. Chronological thinking is central to historical reasoning because it enables us to organize our thinking about the past, consider relationships between events, determine cause and effect, and identify the structure or "plotline" of stories told about the past (i.e., those contained in accounts or historical narratives). It entails more than simply filling out a timeline, although timelines are essential tools for helping students understand chronological order and cause and effect relationships, and other patterns in history.

In this article, we highlight the development of a game, *Singapore Surrenders!*, collaboratively designed by a group of historians, history education specialists, and game designers to help students develop their chronological reasoning skills and to learn about events leading to Singapore's surrender during World War II. We outline our conceptualization of the game, the process of designing the game, and its implementation in an undergraduate course on Singapore history.

The thinking behind the Design

The *Singapore Surrenders!* game was conceptualized as a part of *The Historian's Lab*, an effort initiated by the Humanities and Social Studies Education (HSSE) Academic Group at the National Institute of Education. The theoretical framework which defines *The Historian's Lab* has been generally influenced by the work of Vygotsky (1978) and Bruner (1977), especially with regard to their views on the child as an active problem-solver, having his or her own ways of making sense of the world, and whose level of psychological development can be potentially improved under proper adult guidance or collaboration with more capable peers. In these classrooms, the teacher designs and facilitates dynamic learning experiences and supports the child's construction of knowledge by encouraging active participation and collaboration (Mercer, 1991). Notions of

constructivism, situated learning (Lave, 1988; Lave & Wenger, 1991) and cognitive social learning (Rogoff & Lave, 1984; Rogoff, Matusov, & White, 1996) have guided the *Lab's* design of curriculum materials and rich tasks to support student learning. These ideas may be summarized by the four principles that undergird the project's approach to learning and knowledge construction, namely: a) that learning is interactional and collaborative in nature; b) that learning occurs through participation in a community; c) that knowledge is socially constructed within specific contexts and social engagements; and d) that learner competency can be progressively developed through the co-sharing of knowledge and the design of appropriate scaffolding and guidance.

Another key component of the *Lab's* framework is drawn from research in history education that emphasizes the importance of equipping students with the intellectual tools to understand the nature of history as a discipline. The objective is not only to help students acquire knowledge about the past, but to also equip them with a conceptual apparatus to help them understand the discipline. This includes helping students develop conceptual understanding of core disciplinary concepts that structure the ways people make sense of the past. While "first order" concepts specific to historical topics of study, such as nationhood, independence, decolonization, and communism, are important for students to learn when studying post-World War II history, for example, "second order" concepts are absolutely essential for understanding "how histories are put together and what counts as a valid historical argument" (Seixas & Morton, 2013, p. 3). The 2nd order concepts of historical significance, accounts, evidence, chronology or continuity and change,

cause and consequence, historical perspectives, and empathy are core to the discipline as historians engage in debates around these concepts. They help us organize our thinking about the past, enable us to make our own claims and arguments about the past, and help us more effectively construct knowledge about the past. They are absolutely vital constructs for historians and for history education. For our purposes, we wanted to focus on chronology, because we thought that could also help students think about causes and consequences as well as the significance of key events in the history of Singapore's fall.

It was with these two key ideas in mind – that all learning is social and that learning history hinges on understanding 2nd order concepts (Afandi, 2013) – that we started to focus on designing a game that could help students understand the chronology of Singapore's surrender. This led us in two directions: 1) consult academic historians and educators who could inform us about the events leading to the surrender; and 2) understand the principles and potential of game design to support student learning. In terms of better understanding the history of Singapore's fall, we consulted a veteran history educator (Chelva Rajah, HSSE) and two historians, Ang Cheng Guan (NTU) and Kevin Blackburn (HSSE). All three shared their views, key source materials and secondary accounts that could help us better understand the contexts of the surrender, different individuals and groups who played a central role in the surrender (e.g., leading commanders in Singapore during the War, local populations, etc.), and specific events from the date when Yamashita was given the order to invade (8 December, 1941) to the Japanese victory parade when Singapore was officially renamed Syonan-to (16 February 1942). Several members of the group also took a guided tour of the Battlebox (see

http://www.battlebox.com.sg/ for more information on the site and tours), which also provided important details about what

transpired after the Japanese invaded Malaya. Since we wanted to better understand the events leading to surrender (the sequence or flow of events as well as causes and consequences of events), we focused on developing a chronological list of key events.

Designing the game

In Singapore's classrooms, teachers are increasingly expected to address 21st century competencies and teach for understanding, and games are a promising technology that can be used to support these educational goals. Using games effectively and reliably is challenging however, and teachers need to be provided with time, resources, and an understanding of game-based pedagogies in order for games to be used successfully. In a survey of 479 Singapore teachers, Koh, Kin, Wadhwa, and Lim (2012) found that the "majority… have a positive attitude toward the use of games in education" (p. 55). The authors note, however, that most teachers (59%) reported using games rarely (less than once per month) (Koh et al., 2012). Reasons for games' lack of use include insufficient classroom and curriculum time, insufficient resources, high costs, difficulty finding games that fit their curricular needs, and adverse parental reactions to game-based learning. Though games are well-liked by teachers and supported by government initiatives, significant barriers to games' effective use must be addressed, including designing games that align with curriculum and ensuring that such games can get into teachers' hands.

In our design, we wanted to fully address these issues by making a game that is useful for teachers. As such, the game needed to include the specified curriculum, keeping in mind common classroom constraints (e.g. time, resources), and still resembling what we considered to be an engaging game. In particular, our aim was to design a game that would 1) encourage players' historical thinking especially around content related to the Singapore History syllabus and that 2) could be played by lower Secondary school students in less than fifty minutes.

We began designing by familiarizing ourselves with the events leading up to surrender and identifying key learning objectives (for students to collaboratively reason about the order of events and understand the chronology of events leading to Singapore's surrender) with the help of subject matter experts. The role of the game designers was to help the team relate educational games to the learning goals, drawing on the idea of game design as "activity characterized by reflection-in-action (Schön, 1984), in which designers draw connections between the immediate design problem and their own prior experiences" (Gaydos, 2015, p. 478). To accomplish this, the design team introduced the subject matter experts to what were seen as relevant educational games as potential models to consider. The team was encouraged to reflect on the desired learning outcomes, the constraints of "typical" History classrooms that the design needed to meet, and to consider different types of games to develop a viable solution that could meet key curricular objectives.

Two games were identified as potentially useful for addressing the learning goals and suggested as prototypes: 1) an educational game whereby players role-played as journalists trying to write about the events as they occurred during the war and 2) a game about constructing a time line of events leading up to the surrender. In part because the second game could be created very quickly, it was chosen as the first to prototype. The game, *Singapore Surrenders!* is an adaptation of the commercial game, *Timeline* and

includes the historical events that led up to Percival's surrender of Singapore during World War II.

To play *Timeline*, players are dealt a hand of five cards. Players then take turns placing a card from their hand onto a table in front of them, indicating whether the event occurred before or after the cards already on the table, placing the card to the left or right of already-laid cards. The event cards that players use in *Timeline* are two-sided, and the dates of the event are only printed on one side of the card. While holding the cards, the players cannot see the dates, but when the card is played it is turned over so that the date is revealed. If the location is correct (e.g. if it was placed to the right of an event that happened earlier in time), the card stays on the table and the player's turn is over and their hand size is reduced by one. If incorrect, the card is placed on the table but the player must then draw a new card so that they have the same number of cards in their hand as at the start of their turn.

Developing the *Singapore Surrenders!* version of *Timeline* was straightforward. Based on the events identified as significant by our study of the fall of Singapore, we selected 50 events leading up to the surrender. We aimed for 50 events to ensure that four to five players would have a sufficient number of cards to play with. The 50 events that were selected were then made into cards, including accurate times/dates for each event, creating brief descriptions for each event to give students additional relevant information, and hiring artists to lay out and create the graphics for each card.

Figure 1: Singapore Surrenders! card game.

You try! Place these events in chronological order, from 1-5
a. _____ General Wavell ordered by Churchill not to surrender
b. _____ Yamashita moves his HQ to Ford Factory in Bukit Timah
c. _____ British warships, HMS Prince of Wales & Repulse, arrive in Singapore
d. _____ Combined operations headquarters moves from Sime Rd. to Ft Canning
e. _____ Japanese forces take Penang
What were the reasons you put them in this order? What were you unsure about?
(*See end of article for anwers)

Singapore Surrenders! was designed to be a prototype of a game that could be used in classrooms as complementary and/or supplementary material to support significant curricular and instructional goals in classrooms. It could be used during a class period or for revisions, and packaged with pre-game learning activities to prepare students for the game and with post-game activities, such as an assessment that requires students to identify the five most significant events leading to the fall of Singapore. As such, the game design is aligned to the teaching, learning and assessment of the secondary school History curriculum. The use of immersive gameplay supports the learning of history as a social process since it involves first-hand participation and encourages interactivity among learners. The use of the game can also create an enjoyable, motivating and conducive learning environment to foster conceptual thinking and historical reasoning.

Implementing and evaluating the game

Once a playable prototype of *Singapore Surrenders!* was complete, piloting and evaluation began. Playing games had been a vital part of our initial meetings where we explored games that could be adapted to support history education. We were therefore the first play-testers of *Singapore Surrenders!* and our aim was to determine if the game could be reasonably played by students, would be engaging, and would support collaborative, classroom-based history learning. We discussed the extent to which the game supported logical reasoning, chronological thinking, collaboration, and challenging fun, and made minor changes for playability (e.g. font size, accuracy). The game was then determined to be ready for further play-testing.

Figure 2: Game designers hard at work.

The first external test of *Singapore Surrenders!* was with first year undergraduate History students in NIE. It was a follow-up to the main lecture where students were provided with information on the outbreak of war and the outcome of the war as well as reasons for the British defeat in Malaya. To prepare the students for the card-based game, which is focused on the chronology of the Malayan campaign and events in Singapore leading to surrender, three video links on the Malayan campaign were provided and a website on the animation of the Battle for Singapore was recommended as preparatory work for the session.

On the day of the lesson, students were asked to sit in groups of 4 or 5 and the lecturer gave an introduction to the lesson objectives and rules on "how to play the game." After this brief introduction, students began the card game. Approximately 30-40 minutes were given to play the game and subsequently 15 minutes were dedicated for classroom discussion about the game.

Each of the groups were able to pick up the rules of the game fairly quickly and the turn-based gameplay proceeded well. As it turns out, in all the groups, the main objective became not one of winning the game, but rather the students were generally more focused on completing the

chronology / timeline of the Battle of Malaya and Singapore. This meant that rather than competitive play, what was witnessed was collaborative and cooperative play. Members of the group actually worked collaboratively to find out the proper order rather than compete with each other. The game was driven by interaction, students asking questions, deliberation of events and chronological order, and fun with students using what can be characterized as *inquiry-driven interactions* to better understand specific events and their ordering by drawing on individual prior knowledge and perspectives as well as by using mapping apps such as Google maps to better understand the geographical location of certain places. Students were using the movement of events across Malaya and within Singapore to logically consider the sequence of events.

The interactions below illustrate this point:

Interaction 1

Student A: "Ok, my card states 'Japanese attack Pulau Ubin'. Pulau Ubin is in Singapore, isn't it?"

Student B [an exchange student]: "Oh yes, Pulau Ubin is in South, isn't it?"

Student C: "It's in North-east".

Student A: "Ok, I'm going to place my card here, although I'm not sure". [The card was placed 2 slots wrongly, and afterwards they moved it to the right slot].

Student B: "So that means they went to small islands first (i.e. around the mainland) and then to the big Island (i.e. mainland Singapore)".

Student C: "Yeah, correct. So they went in the West Direction".

Interaction 2

Student A: "I don't know where Kampar is [and takes the phone to check on Google maps]"

Student B: "I think Kampar is somewhere here [points to some cards in the timeline]."

Student A: "Ok this [shows the Google map to group members] is Malaysia. Kampar is here and Kuala Lumpur is here and then they go down to Singapore".

Student feedback on the game was generally positive. There was consensus that the game helped them to better understand the chronology and sequence of the invasions of Malaya and Singapore as indicated by the following comments:

"The game provided a sequential flow of how the invasion of Singapore transpired. This helped me to better understand the significant events that took place."

"The game was helpful in understanding the Surrender of Singapore better, as it puts events in perspective in relation to each other."

During the game play, the students were observed *thinking aloud* and *helping* each other by sharing their knowledge and perspectives on events that took place. Given that some of the cards had very specific details (e.g. in addition to dates, specific times as well) for certain events that were not familiar to them, they made guesses based on their *general knowledge*,

what they had learned from pre-game activities, and *logical reasoning*. Logical reasoning was mostly based on their geographical knowledge of places. Orienting events spatially seemed to help them orient the events temporally. For example, they looked for the routes that troops followed and used this to decide where to place a card accordingly in the timeline. As one student stated in the post-game debrief, "The dates and times make it very challenging. It forces us to make sense of events based on our common sense." When a card was placed wrongly, the students discussed where it should be placed by talking about the particular event mentioned in the card. This approach seemed to encourage them to analyse and discuss specific events with reasoned arguments for ordering the events.

When a team member finished all his/her 4 cards, they continued to play the game until all cards were placed in the timeline, although the game only requires to finish the four cards they hold on to. According to one student, the main reason for this was because they were "*curious* to learn what happened *next,* rather than just *winning*."

When the timeline was completed students re-evaluated the events so as to better understand the *chronology*. After the game students were asked to complete a questionnaire which was aimed at understanding their views on the game and how it helped them to better understand the Surrender of Singapore. Collaborative efforts, curiosity, interactivity and visuals were highlighted as the most liked aspects of the game. One student stated, "it helps to make [history learning] more interesting."

Overall, students seemed to use the game as a learning platform to better understand the *c*hronology (or the sequence of events) that transpired during the battle of Malaya and Singapore's surrender and to *enhance* their *content knowledge* on each event. In addition, based on our observations we think that the game was effective in promoting inquiry-driven learning and the use of technology (map apps). In fact, students felt similar games can be adapted in understanding other historical events such as World War II, the Founding of Singapore, and the Independence of Singapore. As one student put it, similar timeline card games are useful "especially for topics that require the knowledge of the sequence of events to understand the context and understand why the people then think or feel a certain way."

Conclusion and next steps

Now that we have designed and piloted the game, our next steps are to make it part of a curriculum package that would include pre-game instructional activities as well as post-game activities and assessment. For example, we have discussed having the students write a short account of the surrender of Singapore by selecting the 5-7 most important events leading to the fall supported with reasons for why these contributed to eventual surrender. We will also use feedback from the game to revise some of the information on the cards. We are planning to research student learning from playing the game as well, once it is implemented in secondary classrooms.

Based on the first pilot run, more attention needs to be given to students' understandings of the Surrender of Singapore, in terms of *significance* and *causation.* In particular, lesson objectives could incorporate understanding of these competencies and implement the lesson in a way to encourage group (and/or classroom) discussion on these concepts.

This could also include a *post-game activity* to assess their understanding and reasoning leading to decide which events they deem as most significant and why; what they see as key causes leading to the surrender; the consequences that certain events had in terms of Singapore's history, and so on.

We also identified several challenges encountered by students during game play. One is the need for sufficient space to play the game. Given that the card pack comprises 50 cards, students need ample space to lay out all cards in the timeline. This also means that some students need to stand up and play as it is difficult to capture all the events in the timeline while seated. In order to mitigate this challenge, one group of students arranged the cards on the table according to the year and in different rows. The lack of geographical knowledge and understanding about places and unfamiliar places was another challenge students had, although they discussed many of the places that were represented on the cards. In order to overcome this challenge, students used their phones and mapping apps to investigate where certain places are located and sharing this information helped them decide the sequence of specific events. Though these challenges can be seen as shortcomings of the game, they also provide opportunities for teachable moments, compelling students to further investigate the events that the game introduces. We see support for these extension activities as essential to integrating the game into history curriculum. As *Singapore Surrenders!* exhibits, commercially available games like *Timeline* can be readily modified to fit local curricular needs, but these modifications are only the beginning of the work necessary to support games' effective use.

As we advance our understanding of game-based learning, we find it increasingly necessary to adapt design processes that enable the reflection on and modification of the practical issues associated with applying games to classrooms. The historian, Christopher Lasch (1977), warns that we may run the risk of "contamination of play and serious activity" (p 24), by way of introducing some ulterior motives that drive the activity away from the player and the play experience. We nevertheless believe that a careful marriage of game play and content offers an opportunity for serious fun – the challenges of learning history combined with playful social interaction – so long as we reflect on both regularly throughout the game's development.

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Answer key:
a. 3
b. 5
c. 1
d. 4
e. 2
How did you do?