

Tangential Learning in Board Game Design to Introduce Peranakan Culture

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Abstract: Lifelong learning is one of the main ideas in Sustainable Development Goal; this means we are encouraged to always learn about new things even when we currently don't need any new skill to solve a problem. People usually need some clue or stimulus to start that process, entertainment media such as games can be one of them. While educational games have a direct function to teach a specific subject using game system, it has been known that they're usually not very attractive for the general population. To make learning effortless, the person must first be interested in the subject while doing something fun. The game doesn't need to teach the whole concept about the subject; it can just bring awareness to their existence. That is Tangential Learning. Usually, it is used as a quality people mention in game research studies, rarely as a concept for game design. In this paper, we try to link Tangential Learning directly into game production through Eight Kinds of Fun. Combining them with Self Determination Theory and MDA framework, it is possible to design a game which indirectly encourages learning and not falling into educational games. Qualitative narrative research will be done to find out the market's current interest before starting the design. Information will be scattered all over the game dimension by designing all aspects of the game with reference to cultural artifacts, narrative foundation will be placed on significant historical events, and the gameplay will be designed in consideration to ludonarrative harmony to make sure the narration and the gameplay are coherent. In this condition, whichever aspect the player was interested in while playing will have something to learn further about. To sustain the player's interest longer and spark their intrinsic motivation to learn, strengthen the social aspect with cooperation play mode so people will work together for a common goal and discussion about the same subject is more likely to happen. The interactive nature of games also creates a sense of autonomy for the player to decide which subject they want to learn first or if they want to learn at all.

Keywords: Tangential learning, Self-Determination, MDA framework, Board game, Chinese peranakan, Culture preservation

1. Introduction

Most gamers would have experienced being intrigued by some aspect or specific term in the game they are playing and then looking it up online or in books, sometimes ending up finding lots of data and learning something new from it. The game itself might just use the subject as one aspect of the game or one of the existing items, but because the player is interested, it is possible for them to self-educate. This type of learning which occurs because of revelation to new information while doing something fun is called Tangential Learning (Floyd & Portnow, 2008). With Tangential Learning concept, it is possible to design a game to encourage learning in a subtler way while not falling into the realm of educational games. This is important because intrinsic motivation and interest are expected to be much higher in video games selected for entertainment purposes than those chosen for educational reasons (Ritterfeld & Weber, 2006). Tangential learning concepts reach out to people better because the main goal of the game isn't hammering specific knowledge into the player. They can do self-education if they're interested enough after interacting with the game. This concept goes well with Sustainable Development Goals number four, which is lifelong learning. Even when people are not in any formal education program, the possibility of starting to learn again will increase if they can get new hints from the entertainment media they enjoy. Unlike typical digital games which often fall into a certain gameplay format, many physical board games have unique gameplay which makes the option for gameplay broader. At the same time, the physical side makes sure it's kept as simple as possible.

Ascertaining the continuity of local culture is one of the Sustainable Development Goals. Chinese peranakan culture is a result of acculturation between Chinese descendants' culture with local Indonesian culture (Itjen Kemdikbud, 2023). In the history of Indonesia's Orde Baru era (1966-1998), the Chinese peranakan culture and descendants were oppressed (Putri et al., 2022) which results in the decline of their culture, even when the political oppression has mostly ended now. Incorporating the culture in the board game design is an effort to promote one out of many Indonesian cultures amid identity erosion because of globalization (Peng, 2023). Materials about the culture will be integrated into Geger Pacinan tragedy in 1740 to make the game's setting and conflict more precise and measurable. Chinese peranakan influences the local culture differently in each area and results in different culture artefacts in different provinces. Until today, there's still no digital encyclopedia for Indonesian's Chinese peranakan culture knowledge, they're mostly blended into other local ethnic group or province's list of cultural artefacts like Lasem batik (Java), soto mi (West Java), koko clothes

(Betawi moslem), or bakpia (Yogyakarta). The game can't feature all the culture artefacts that should be available because of the limitation of the product, but some of the card design will have QR code to link players to a web page which contains further information about the item to motivate players to start researching about the culture further.

2. Methodology and Literature Review

2.1 Game-Based Learning and Tangential Learning

Game-Based Learning is a concept of learning by playing games which are developed to reach predefined learning outcomes (Şendurur & Sendurur, 2022). These types of games are usually called Educational Games or Serious Games. Educational Games has a very similar definition to Serious Games. Educational Games are games specifically developed for the educational context (Concilio & Braga, 2019). They are designed to help people understand concepts, learn domain knowledge, and develop problem solving skills as they play games (Ge & Ifenthaler, 2017). Serious Games focus precisely on the design, development, use, and application of games for purposes other than entertainment by exploiting the increased user motivation and engagement to promote learning, construct knowledge, raise awareness or inspire behavior change (Vaz de Carvalho et al., 2021). The mechanic of the game must be appropriate to the learning objectives (Arnab et al., 2015) even though it might be not identical to the objectives of the game.

Tangential learning happens when people learn about a subject by being exposed to it in a context that interests them, rather than through direct instruction (Floyd & Portnow, 2008). This method of learning encourages self-education which is important for lifelong learning. The goal of the game might not be learning, but appreciation for the material can be grown. Considering the definition, Game-Based Learning is different from Tangential Learning, but it is possible for Tangential Learning to exist in serious games because to integrate materials for Tangential Learning is simpler than Game-Based Learning. Learning objectives of Tangential Learning doesn't require very deep understanding of the material. The important point is to make the game interesting enough so more people will be exposed to the information through playing rather than making sure the gameplay delivers the learning objectives accurately.

2.2 Self Determination Theory

Self-Determination Theory by (Ryan & Deci, 2000) says that there's three elements which can facilitate intrinsic motivation in people, that is autonomy, competence, and relatedness. Autonomy refers to freedom of choice the learners have. Competence means there's a sense of capability in oneself to do what's needed and then had the sense of growth or development as the learning progresses. This doesn't mean it has to be easy, but the hurdle must be just a little above the learner's current ability. Relatedness refers to the support from the people and conditions around the learner to pursue it. Competence and Relatedness can be translated into two out of eight kinds of fun by Mark LeBlanc: Competence to Challenge and Relatedness to Fellowship. Self-Determination Theory's element of Autonomy is already present in the game as it is an interactive medium and it is further imparted as a freedom to research more about the subjects or not after the game ends.

2.3 MDA Framework

Based on MDA Framework by Hunicke et al. (2001), there are three elements to consider: Mechanic, Dynamic, and Aesthetic. Mechanic is about the rules and objects in the game. Dynamic is about what the player does while interacting with the game. Aesthetic is about the feeling player will experience when they're playing, especially what will make them interested in the game. These three elements can be viewed in two directions: Mechanic > Dynamic > Aesthetic (game designer's point of view) and Aesthetic > Dynamic > Mechanic (player's experience). We want to design the game based on the player experience so the second direction will be used. These elements will be designed with the help of other disciplines' theories.

2.4 Eight Kinds of Fun

Eight kinds of Fun by LeBlanc (Hunicke et al., 2001) mentions Sensation, Fantasy, Narrative, Challenge, Fellowship, Discovery, Expression, and Submission as a list of types of enjoyment people can usually have when playing a game. The media which can be used by tangential learning to relay information is none other than the four main types of communication available: verbal, non-verbal, written, and visual. In this case, we can incorporate tangential learning into parts of Eight kinds of Fun which have an element of communication. One game can contain more than one of them. Sensation is the fun part of the game which can be felt with player's five sensory (vision, sound, smell, touch, and taste). Usually in a physical board game, vision is dominant, and it can be used as means of communication. For example, the graphics of the game element can be designed with

shapes and color meanings unique to the culture. Fantasy means the game becomes another world that the player can feel like living in. In a board game, this implies the world design, game system, and backstory which also can be used for communication. Environmental storytelling like illustrations of the environment, items and character can convey lots of things but doesn't interrupt gameplay (Bracikowska, 2020). Narrative means the game has a strong story element. Story is part of verbal or written communication media which can be used to convey moral values or intangible culture artifacts. Challenge means the game presents obstacles as an important or big part of the game. Fellowship means the game uses social feature as an important part of the game. Discovery refers to a kind of game in which the players explore the game world and open a new area in that way. Expression is the kind of game where the players have means to express themselves, for example a dress-up game or designing a room. Submission refers to the type of game which can be played idly. Our board game itself shall have at least five, which is Challenge, Fantasy, Fellowship, Narrative, and Sensation.

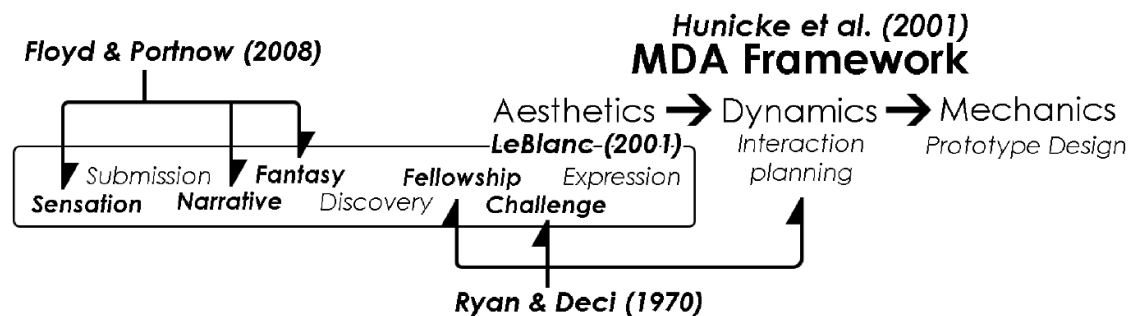


Figure 1: Theoretical Framework

2.5 Imperative Game Goal

In a game, it is possible to have several levels of game goals. The topmost level is the ultimate goal. They are usually more abstract, not directly tied to the game mechanic or dynamic. For goals which directly translate into game mechanics is called ludological goal or Imperative game goal. In Imperative Game Goal Typology made by Debus et al. (2020), there are ten types of game goal: Choose, Configure, Solve, Create, Find, Obtain, Optimize, Reach, Synchronize, and Remove. Choose is choosing the right answer among several options, much like a multiple-choice question. Configure is arranging answer pieces until they're all in the right place, for example a puzzle picture game. Solve is giving the right answer for several problems in which the clue or answer is not clear in the game, for example solving several item arrangements and pushing a button to get one door open. Create is crafting items needed for the goal. Find is finding the answer among the other items, such as looking for certain items in a very big picture. Obtain is gaining items needed to finish the goal. Optimize is for achieving the best possible condition in a limited number of times or turns. Reach is for reaching a certain spot or place for finishing, like in a race game. Synchronize is for replicating what the game asks, much like arcade dance game. Remove is for selecting and removing certain items or people to win. One game might have one or several combinations of this. For easier understanding, we will refer to this typology in the discussion about the game.

3. Result and Discussion

3.1 Genre Survey

To design a board game with tangential learning in mind means we need to know the target market's general interest first. In this case, game genre can be a starting point. Genre in board games usually means the core mechanic, theme, or components (Ristov, 2024). This also means one game can fit into several genres. Determining this is a crucial step before designing other aspects. To decide, the writer did a small survey of 15 respondents in the productive age (20-40 years old) who were gamers (but mostly digital games) and had a middle-to-high income. This survey was based on three alternative scenarios which can be developed into a game with integrated culture artifacts. The survey was done through online chat apps around end of March 2025.

Table 1: Scenario & genre alternatives

	Alt 1	Alt 2	Alt 3
Game Scenario	Collector, hoarding as much culture artifact as possible	18-19 th century merchant, growing business and building connection	Modern people got thrown to the past, on survival and looking for ways to come back
Genre	Monopoly	Resource management	Survival

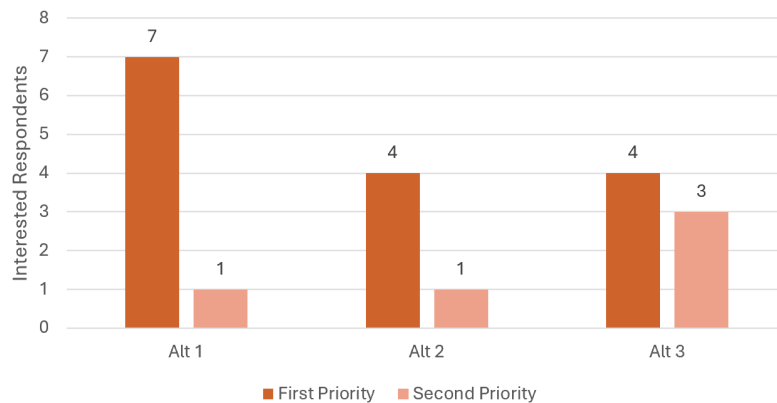


Figure 2: Result of survey

“First Priority” shows their first choice, “Second Priority” is an alternative, but wasn’t compulsory. The result shows that the respondents like the first alternative more, but this result was followed by reasons. The respondents who choose the first alternative mostly don’t want a complicated game or they prefer something they’re more familiar with, with one of them wants to focus more on the message of the game. The ones who chose the second alternative mostly are the boardgame fans who like more challenging games which have many variables. The ones who chose the third alternative like the middle level of difficulty, with one of them was interested in the story.

From this result, the writer chooses to continue with the third alternative considering moderate level of difficulty which still has potential to appeal to beginners but at the same time is not too boring for experienced board game players. This can also be observed from second priority answers, which is the highest in the third alternative compared to other options. This shows that more respondents were interested in trying it out even though it was not their priority.

3.2 Game Blueprint

Survival genre is a subgenre of action games, set in hostile, intense, open-world environments. It is a blend of exploration, resource-gathering, crafting in an environment with some kind of ever-present risk or threat which the player must avoid or in some cases, fight (Lane, 2013). To set a proper base for the genre, the writer decides to use Geger Pacinan tragedy in Batavia 1740 because that’s the moment where the Chinese Peranakan has already grown large in number and can be distinguished. They were largely concentrated in one place and there’s a pogrom happening so it’s a good base to develop the game according to the genre and featured culture artifacts.

3.2.1 Aesthetic

Tangential Learning wanted the process of learning to be done while the learner is doing something enjoyable, that means interaction in the game itself doesn’t have to be educational, just needs to be fun. In this case, we should look at all dimensions the game and media have which can be used to convey information. Sensation fun sums up the dimension human’s five senses can have. We can design the look of the game element in reference to visual of Peranakan Culture’s visual like their architectural patterns or fabric patterns like in batik pesisiran or batik encim. Culture artifacts will be presented as rare items in the game. In game character stories can also be used to convey information, much like a witness’s story. If players are given a main character to play, they can feel as if they live as a character in the game who is part of the situation. These are also two of LeBlanc’s Eight Fun, Fantasy and Narrative.

Self-Determination Theory in Aesthetic part is used to help direct players' enjoyment to create an intrinsic motivation to learn, in this case: Challenge fun and Relatedness fun can be incorporated. Challenge refers to games that's competitive or with increasingly difficult challenges. Competence from Self-Determination Theory describes that to support the growth of intrinsic motivation, appropriate challenge and sense of progress are required. Survival games typically provide more challenges to finish compared to other genres; this can be made easier by designing several modes of play. Fellowship refers to games that's big on their social functions. Relatedness from Self-Determination Theory highlights the importance of the support from the people around to pursue learning and having a community which also has the same interest. While board games usually played with some friends, social element can further be strengthened with cooperation play mode so everyone will work together for a common goal and discussion about the same subject is more likely to happen.

3.2.2 Dynamic

The dynamic part will mainly be designed based on ludonarrative harmony in consideration for survival genre. Ludonarrative comes from a combination of ludus which means a game and Narrative which means a story. Ludonarrative harmony is used to describe when two separate elements work in sync with each other and simultaneously build a consistent experience. Ludonarrative dissonance refers to the experience of disconnectedness between the story and gameplay, in contrast, ludonarrative harmony is the experience of connection between the two (Ash & Despain, 2016). This aspect should be considered if the game has some kind of story going throughout the gameplay. Survival genre is generally more challenging, so we create several opposing forces for hindrance. To fit the theme, we decided that the main opponent in the game is VOC, which will be simulated by the game system, creating a confusing and oppressive situation. To imply the unpredictability and out of control situation, the conditions within city will be different every round, sometimes there might not be any soldier, sometimes one in each spot, sometimes more. There's also food or hunger problems every round and Malaria sickness within the city area. The cost for food at each round might go up as time goes by, this will make the condition gradually grow harsher as the players try to finish the goal as soon as possible.

The ultimate goal of the game is to finish a set of quests given in a goal card. There will be characters players can play as, characters player can rescue (victim), and items to collect. Each victim has their own story in several parts, triggering quest chains. The main imperative game goal is Obtain, but on a smaller scale there will be several other game goals, like Create and Reach depending on the tasks. The game will use a map which shows the city and surrounding area. The areas will be divided into several spots which have several character slots and a deck of cards which player can draw from if they're in that spot for that turn. Each round will have a day and a night turn to simulate daily character activities. There are also areas available only in one of the turns. Players need to gather various items from areas available and finish their quests to reach the ultimate goal.

3.2.3 Mechanic

The mechanic part will bring together the vision in Aesthetic and Dynamic part. The required objects and rules will be listed so a game prototype can be produced.

Genre: Survival

Gameplay: Chance + Strategy

Multiple players

Core mechanics: resource acquisition, challenges (quest) & rewards

Primary mechanics: action points, resource management, attack & defense

Secondary mechanics: weapon & equipment, skills

Components:

Main properties: area map board, character standee, money token, malaria token, hunger token, soldier token, character card, goal card, item card, situation card, daily quest card, dice, story booklet

Additional properties: player board

Area & system set up:

- Each area in the map has their own deck of item cards, except the city gate and sugar factory
- Each player picks one player character card and standee to use in the game

- All players start the game outside the city area
- After each round, renew the daily quest card and situation card
- Place soldier tokens blocking the character slots in each spot according to situation card in that turn
- Every character which satisfies the condition shall roll for malaria infection each round

Cooperation play:

- All players work together for 1 goal which will be drawn at the start of the game
- Each player has 3 AP every day/night turn
- AP is used every time a character move area, drawing a card from the pile in an area, battles without moving area
- The party can only keep as many victims as the players' total number (ex. 2 players = 2 victims, 4 players = 4 victims)
- Every turn the party needs to pay food cost X (number of players + victim kept).

4. Conclusion and Further Research

Tangential Learning is usually used as a quality people mention in game research studies, we have yet to see it as a concept for game design. In this research, we linked Tangential Learning directly into game production through Eight Kinds of Fun. It is possible to create a game which is informative but also encourages learning by merging Tangential Learning and Self-Determination Theory. Gameplay can be kept fun because the learning objectives are simpler. It started by defining the topic we want to introduce and then surveying the general market's interest. In this research, the survey is already based on several options, but it can also be done with broader options if the game development team has more time and resources. Detailed game design can start after the survey. Tangential Learning goes into the aesthetic part of the game, the Eight Kinds of Fun, and the game mechanic is still determined by the gameplay experience design, not directly by tangential learning itself. Self-Determination Theory in this case has a highlight on social function. The game needs to form a supportive group, community, or as simple as strengthening the bond of friends who can talk about similar subjects. Another important point is the sense of competence so people will keep playing, which can be supported by creating simple task systems with rewards.

It is important to note that this research hasn't included survey results from the game which was done with this framework. It is better if we can get comparative results about the culture knowledge from the players before and after they play the game also whether they feel any curiosity to explore further about the culture.

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AI Declaration: AI was used in the research to explore previous research and fix grammatical errors.

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