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Master's Thesis
Academic Year 2022

Design Added Information
Dynamic Characters Card for TV Series Viewing



Keio University
Graduate School of Media Design

Xiaoshuo Zhang

A Master's Thesis
submitted to Keio University Graduate School of Media Design
in partial fulfillment of the requirements for the degree of
Master of Media Design

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Abstract of Master's Thesis of Academic Year 2022

Design Added Information
Dynamic Characters Card for TV Series Viewing

Category: Design

Summary

In recent years, with the development of technology and innovation in content, the demand for casual entertainment videos has been gradually increasing. Various countries have also started to introduce more and more TV series of various genres from each other. One amazing phenomenon in the international TV drama market is that some dramas that gain popularity and achieve success when broadcast locally fail to achieve similar success overseas, especially in certain specific countries and markets.

This research explores why a phenomenal TV series with high local ratings cannot be disseminated overseas. This paper will dissect the reasons from multiple perspectives of artistry and commerce. Then, it will focus on one of the main reasons, select a TV series as the research object for an in-depth discussion, and provide a methodological-based solution.

Keywords:

tv series, storytelling, video on demand, interactive tv, characters, network, media

Keio University Graduate School of Media Design

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Chapter 1

Introduction

1.1. Current Background

There are many excellent films and TV works that, even though they have achieved very excellent ratings in their home countries, have not been able to achieve the same results in certain countries outside their home countries. Even the popularity is low and little known. For example, a top-rated Chinese palace TV series *Empresses in the Palace*, firstly broadcasted in 2011 in China, has reached a phenomenal status and is still re-watched multilaterally and brought up for discussion by its fans even ten years after the broadcast. The phenomenon even made it to the Weibo hot search in 2021 [1]. However, it did not achieve the expected ratings after its introduction to the Japanese market and broadcasted through a Japanese TV station in 2013 [2]. The Japanese audience's awareness of it was entirely out of proportion to the popularity of this TV series in China. The German TV series *Dark*, which this paper will use as an example, has achieved high ratings upon its release on Netflix. Usually, the more suspenseful a TV series is, the more difficult it is to be logically self-contained, so the ratings usually drop a lot. However, after three seasons, the series has maintained a rating of 8.7 on IMDb, a definitive website for world video ratings [3]; and over 90 percentage on Rotten Tomatoes, a leading video content rating platform in the US [4]. However, the series's popularity in Asia is shallow. On Douban, a leading Chinese film and TV series community and rating site, the series has only 12,000 panellists [5], compared to the 230,000+ panellists for the similarly rated TV series *Empresses in the Palace* [6], indicating that its influence only accounts for 5 percentage of *Empresses in the Palace* popularity. So, what prevents many excellent films and TV works from being widely distributed overseas and achieving the same excellent results as their local counterparts? This paper will dissect the reasons

from multiple perspectives of artistry and commerce and offer a set of solutions.

1.2. Problems Statement

The following analysis is based on the example of *Dark*, a German TV series on Netflix that aired from 2017 to 2020 with three seasons. It has received a high rating and excellent reputation but is still not widespread enough in Asia. In the survey conducted in this research, 50 people in the 20-30 generation age group in China, Japan and Korea spend an average of 2 hours or more a week watching TV Series. Of these people, less than five knew about and watched the drama *Dark*. It means that the influence of this highly-rated drama in Asia is minimal. So, what exactly is stopping this excellent work from spreading overseas? This paper will first introduce and analyze this work and propose several hypotheses about the reasons from artistic and commercial perspectives.

1.3. About *Dark*

Dark is a German TV series produced by Netflix. It is a story about supernatural time travel that unfolds through the disappearance of a child. *Dark* does not dwell on which place the missing person is taken to, but rather a particular point in time. Multiple characters travel through different points in time, and in the first season, the series takes audiences to small-town Wenden, in Germany. The story is about the disappearance of a child in a small town in Germany, triggering the unravelling of four families' bonds and uncovering dark secrets, revealing the truth behind a bizarre mystery that spans three generations. The story happens in 1953, 1986 and 2019. Those events at these three points affect each other and intersect. There are also situations where the same person appears in three age groups: teenage, middle-aged and old age, as well as situations where the same person appears at different points in time or the same person at a different age appears at the same time and space. The series of 3 seasons has six timelines and three sub-genres: 1888, 1921, 1953, 1986, 2019, and 2053, which are difficult for the audience to understand on their first watch [7].

This research takes the first episode as an example. Refer to 5.1 and 1.2

1.4. Hypotheses of the Reasons

The following reasons are assumed from the artistic and commercial points of view.

1.4.1 Artistic Aspects

1. The video quality is not visually pleasing enough.

Video quality significantly impacts the audience's viewing experience when watching video programs. In the paper [9], it is demonstrated with data that, "one percentage increase in buffering ratio can reduce user engagement by more than three minutes for a 90-minute live video event". It shows that audiences have specific requirements for video fluency. A less than smooth video can directly affect and reduce the audience's stickiness to the series and the platform. For TV series, which are especially important for long-term user retention, clear video quality and smooth playback are the fundamental guarantees to promote their distribution. The TV series *Dark* is a self-produced series on the Netflix platform. Netflix, the VOD broadcast platform, has over 200 million members in more than 190 countries/regions, with roughly 125 million hours of viewing per day. Netflix uses more than 100,000 server instances on Amazon Web Service(AWS) [10], guaranteeing the smooth delivery of large amounts of video content. Therefore, the possibility of low video quality can be eliminated from the list of reasons that prevented the distribution.

2. The story is too complicated to be understood.

The story's complexity lengthens the time it takes for the audience to understand the plot. Thus, increasing the percentage of audiences who choose to abandon the play because they do not follow the plot. In the book *Storytelling*, it is also mentioned that the most challenging part of the drama is that the audience does not have an equal ability to understand the plot as the story flows [11]. For drama, a lengthened content, if the most audiences have difficulties understanding the story while watching, the percentage of those who can follow and enjoy will be relatively little. It will limit the spread of the series, and eventually, only a small group of people

who can understand the plot will be interested in continuing to watch it. Not only is this a loss for the production team and stakeholders of the TV series, but it is also a missed opportunity for most of the audience to enjoy a great TV series. For *Dark*, this series has been generally defined as a "brain-burning suspense drama" by the market and the audience, which already shows that it has a more complicated plot than "soap drama" and "love-hate drama". In addition, its first season has set three time periods, 1953, 1986, and 2019, each with a 33-year difference. Therefore, the same character will appear in different times and spaces with different age statuses. According to a article [12], many people give up the TV series after watching the first episode because of "the complexity of the story", which is difficult to understand.

1.4.2 Commercial Aspects

The length of TV episodes is not compatible with market consumption habits.

Each country has a slightly different video viewing culture, especially in terms of the number of episodes of a TV series. There are generally fixed formats in Japan, around 10 episodes with 45 minutes per episode. In the case of China and Korea, modern TV series s are around 20-30 episodes, while costume TV series s can be relatively long, reaching 40-80 episodes. American TV series s have a specific seasonal format, with only about 10~20 episodes per season, but popular productions can last for more than 10 seasons. However, in India and some Middle Eastern countries, such as Turkey, where the TV series industry is well developed, the TV series s can usually be 200~400 episodes long. Therefore, when trying to introduce a TV series with more than 100 episodes from India and the Middle East to a country like Japan, where "short TV episodes" are the norm, it is crucial to pay extra attention to whether the product is compatible with the local TV series' consumption habits. Even if production is viral in the region, if it is introduced to a new market, it may be less popular because of incompatible consumption habits in terms of the number of episodes. However, this incompatibility problem usually occurs with too many episodes. However, in the case of *Dark*, it has only three seasons with 10 episodes each. Hence, even in Asia, the hypothesis that the length of episodes hinders distribution can be

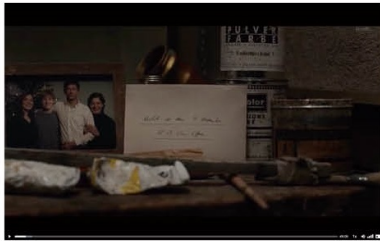
dismissed as a cause.



In the opening scene, several pictures of the characters appear on the wall, and complex lines connect their relationships. Many characters appear one after another, and the narrative is interspersed. This way of opening the first episode left many audiences confused. Even though each character in the first episode has a significant impact on the subsequent plot, without understanding the complexities of the plot, it is easy for audiences to get confused about the characters, including the inability to remember their names and correspond to their faces.



The first episode opens with a scene of a man's suicide. He is the main character Jonas Kahnwald's father, Michael Kahnwald.



He left a suicide note and explained not to open it before a particular time (10:13 pm on November 4). There is also an essential ambiguity about the "time clue", again suggesting that the show is sensitive to the concept of [time].



It follows an explanation of the incestuous relationship between Jonas's mother and another man from another family, Ulrich Nielsen.



Next, it follows with an account of Jonas's state. Due to the sudden suicide of his father and his psychological breakdown, he had to stop school for four months to receive psychotherapy. Afterwards, various seemingly unrelated characters make their appearance one after another, introducing the audience to the first round of primary characters in a non-linear narrative.

(Screenshot Source: Netflix Drama *Dark*, Netflix Japan Official Website [8])

Figure 1.1 *Netflix Drama <Dark> Season 1 Episode 1*



Another high point of the episode was reached when the episode played to the 3/4 parts. The boy, Mikkel Nielsen, goes missing from the small town of Wenden, Germany, in 2019.



A few days later, the father, Ulrich and a local policewoman find a child's body in the dark forest where Mikkel was lost. The father is shocked and in tears. Then, the fallen leaves on the boy's face are gently plucked away. The body's complexion is ghastly white, and the entire area around. The eyes are black and rotten with worms. "This is not my son Miko." Ulrich said.

(Screenshot Source: Netflix Drama *Dark*, Netflix Japan Official Website [8])

Figure 1.2 *Season 1 Episode1*

Chapter 2

Problem Definition

2.1. Problem

This research's problem is that "Most of the audience could not follow the plot and could not understand the story clearly." Unlike movies or stage plays, which are one-time short-run viewing works, what is essential for TV Series is not only the initial appeal to potential audiences but the part of the appeal that attracts audiences to come and continue watching afterwards. It presents in the following table (Refer to Table2.1, as there is a consumption behaviour decision principle to analyze the decision stages of TV Series viewing.

For TV series, the third stage, 3.Decide to continue, is a crucial indicator that differs from movies. The more people reach this stage, the greater the chance that the next episodes will be exposed to the audiences. It also means there is more possibility of getting the whole series to success. Therefore, this research aims to increase the number of people who enter the stage 3. For viewers, the drivers for entering Stage 3 can include "is the story interesting enough" and "can the story be understood". The control of whether the story is good rests with the TV series producer, and this research cannot interfere with the source. However, the initiative to "understand the story" is in the hands of the audience, so this research will focus on the problem of helping the audience understand the story more clearly.

2.2. Issue

The Issue purified from the problem is "inadequate understanding of the characters leads to problems understanding the whole story". This research argues that characters are central to driving the story. Stories are constructed through

Table 2.1 Decision Stages of TV Series Viewing

TV Series Viewing Decision Stages:	Drivers:
1. Generate interest	Actors / post/ trailers. Relevant news regarding popularity.
2. Decide to start watching	Actors / post/ trailers. Relevant news regarding popularity.
3. Decide to continue	Is the story interesting Is the plot easy to understand?
4. Complete the entire episodes	Whether the story has been interesting and has whetted the appetite of the audience. Whether the plot is always understandable, and the characters' relationships are not forgotten in the middle.
5. Decide to repeat viewing	Obsessed with the character roles in the story Feel not enough after watching.

the characters. The interplay between the characters is needed to create the conflict that drives the plot. Therefore, this research focuses on the audience's understanding of the characters in the plot and enhances the viewing experience. Regarding the characters, two minor aspects can be proposed.

In addition, the plot unfolds in an interlaced narrative style, meaning that characters from different plot lines appear interspersed. Although very helpful to quickly understand the background setting, this narrative style can easily confuse the audience when they first watch. For example, the first episode appeared with many essential characters, but after watching the first episode, many people could not sort out the relationship between their characters. So, the audience faces much more difficulties understanding the plot, resulting in many people giving up on continuing to watch the next episode.

2.2.1 Too many characters to memorize

There are over 30 characters in *Dark* [13], and almost every character exists in three identities: childhood/young adult, middle age, and old age. There are

over 60 actors who appear in this TV series. For the audience, remembering the characters is a huge task. In addition, since the names of the characters are in German, it is an obstacle for Asian people with different language habits to remember the names of the characters.

2.2.2 Face blindness caused by different ethnicity

The show involves three different time-spaces, each 33 years apart, and there are different ages of the same character in each time-space. Therefore, the audience must remember the three faces of almost every character and correspond to them while watching the drama. It adds to the difficulty of recognizing and understanding the characters. Likewise, Asian audiences have a challenge remembering the faces of European and American actors [14]. Even though the production team of this drama was carefully selecting actors of different ages for each character so that their facial features are similar, it still requires relatively more work for many Asians to remember the characters' faces. Recognizing face is undoubtedly an issue to solve.

2.3. Purpose

The purpose of addressing this question can be explained in a layered manner. First, to help the audiences enhance their understanding of the characters, including their facial features and the status changes that occur as the plot progresses. Second, to help the audiences understand the social relationships of the characters in the story, moving from points to lines and finally expanding to facets in the form of character relationship maps to help the audiences understand the character relationships more fully. Ultimately, it allows the audience to follow the plot changes by understanding the characters' changes while watching the series, thus enhancing the drama viewing experience.

The purpose of designing the character cards is to solve the problem of not being able to enjoy the TV series due to the complexity of the story. That is, the audience cannot follow the plot rhythm and understand the plot smoothly due to the story's complexity. Thus, they might not enjoy watching the TV series and even abandon a high reputation TV series.

Chapter 3

Literature Review

3.1. External Type Information

3.1.1 Introduction

“External Added Information” mainly refers to the form of “secondary produced information”. In this research, it refers to the content related to the story and characters. The source of information and the action of accessing it must be separated from the action of watching the video. That is, on both television and new media platforms, audiences must firstly pause or turn off the video they are watching, then open another page to get the needed information. As an example of additional information about the story of TV series, there are several forms of “External Added Information” in the market today.

Episode Introduction — Text Format

Some video platforms or websites create a synopsis for each episode to give audiences an overall view of the story. This is content that requires secondary creation by hand. It is an overview of the overall plot of each TV episode. It includes the major changes in the storyline of an episode, the important characters that appear, and so on. Since this kind of secondary information needs to be read by the viewers themselves, the ability to attract the viewers to read it is a topic that needs to be considered when creating the content and displaying it on the page. Therefore, the length of this type of content is usually 50-100 words, which is relatively concise and general.

Overall view of the story as seen in Figure??.



(Source:Netflix Japan Official Website [8])

Figure 3.1 *Synopsis Page*

SNS Community — Web Format

TV drama fans will form groups as well as idol fans, and group communication is a way to better understand the plot. Some sites, such as IMDb [15], TVmao [16], will post content related to the production of the show as a way to attract more fans to the website. These websites use information as a way to attract traffic, while others have clever rules, such as Twitter [17] and Douban [18], to allow users to create their own content. These sites focus more on the community environment, including the interaction between fans and the feedback received after users post content. To provide these users with added value such as interactivity as a way to attract traffic.

Character Relationship Map (CRM)

Character Relationship Map (CRM) mapping is nowadays an excellent solution to help understand the plot. The rationale for this comes from the “storytelling theory” of the importance of the characters in the overall story. Therefore, CRM is a necessary element for TV series especially before it releases. This includes both official productions and fan-generated secondary creations. The character map is based on “relationships” and includes only pictures of the characters and their relationships with other characters. The rest of the information about the

plot and changes in the characters' status is not presented in the relationship map.

3.1.2 Evaluation: Advantages & Limitation

The advantage of “External Type Information” is that there is a stable source to acquire. Because the content has already been created, audiences can visit a fixed location to access it at any time. Regarding the content, it can also be created through user testing by referring to “audiences' favorite content” analyzed by big data.

The limitation is that viewers can only passively accept this type of content. Even if they do not need the information, they can only filter it by themselves after receiving it all, which is time-consuming and lacks initiative. In the case of plot summaries, if the content is too concise, it may not be able to answer the audience's questions about the plot. But if the content is too complicated, the audience may give up reading at the beginning. Therefore, the biggest problem with this format is that it does not provide solutions to the problems and cannot accurately meet the audience's expectations.

3.2. Implantation Type Information

3.2.1 Introduction

“Implantation Type Information” mainly refers to the “Interactive” function. In recent years, the insertion of interactive features in video programs has become a popular trend in the market. Here interactive features refer to a approach to content and advertisement presentation [19]. Audiences can enjoy the video while communicating with content producers and advertisers, thus satisfying the need for intelligence or commodity acquisition derived from watching the video and obtaining added value from watching the video. Interactive features include the following major categories: Interactive TV and Interactive Video-on-Demand(VOD).The main functions include the interaction in the choice and understanding of the plot, and the promotion of commercial aspects such as the commercialization of the items in the series.

Story Aspect

- “Previously on” Segment

Many TV series start each episode with a “Previously on” segment for the explanation to audiences. If a TV series has a long plot, a complex plot, a fast pace or a long update interval and other kinds of factors, there is usually a “Previously on” segment. These factors are not conducive to the viewers’ understanding and memory of the plot. Then “Previously on” can help viewers understand the plot better to some extent. This segment is usually short, often about 30 seconds. Audiences do not feel tired in watching in this length, and also does not take up the time of the main plot.

- Interactive Video Feature

Interactive video is a form of video in which viewers actively participate in the plot by interacting with options. Currently, some of the more well-known interactive videos on the market include “Black Mirror: Pandanaski” by Netflix, or interactive games such as “The Invisible Guardian” and “Detroit: The Changing Man”. Today, interactive dramas are increasingly becoming innovative content that young people love.

In July 2019, Bilibili announced the launch of the “Interactive Video” feature, which allows video creators to create interactive videos with different options, and users to make choices through the player, triggering multiple storylines and endings. Bilibili’s feature allows users to click “progress back” to see the options they have made during and after the video is finished, so they can check the video options they have made in real time. In addition to a small preview window in the video’s interface, there is also a video naming, reducing the cost of recollection for users.

Unlike bilibili’s pop-up options, “Tencent Video” provides users with choices in the form of “story lines”. Here, the unlocking method of the game task pass is cleverly used to enable users to feel the immersive experience even while watching the video.

This feature can be used not only to choose the direction of the plot, but also to help the audience review what has happened to enhance understanding.

Commerical Aspect

- Interactive TV Advertisement Feature

Interactive TV or ITV for short, it is the integration of traditional TV technology and data services. It is a way to increase participation by allowing user involvement and feedback. It differs from internet interactive video in that it usually requires a set-top box to complete a two-way interface between the customer and the programmer and on advertising. All of its services need to go through the set-top box as an intermediate intelligence relay station. On the market now, it is more useful for commercial level than content interaction [20], such as advertising function, ordering goods appearing in the video, etc.

The concept of interactive TV was born in the 1990s, and the biggest innovation is that viewers have switched from passively receiving already produced TV content to making active choices about the content. Moreover, new content can be created to capture secondary value, such as the purchase of goods in the film in real time, thus satisfying the viewers' shopping needs and creating additional business value. In an interview, Innovid's CTO, Tal Chalozin, said that in recent years, audiences are getting used to "putting their credit card in a Roku or an AppleTV or something else. They're used to discovery, like with Siri or Alexa or other stuff." These audiences might be very different from the older generation who watch TV on set-top boxes, and it might be a symbol that the "future of interactive TV" that people have been imagining for years is becoming a reality among the new generation.

3.2.2 Evaluation : Advantages & Limitation

The advantage of "Implantation Type Information", especially of "Interactive function" is that it is more selective in its content and gives the audience more initiative. Audiences can choose the information they are exactly willing to receive during the interactive actions and avoid the over-communication of useless information.

The limitation is that the information is too cluttered and unsystematic, lacking a central axis. The audience can make a range of independent choices from a pre-

set catalog. For example, today's interactive features are mostly multiple choice questions, where the audience can only participate in the change of state of a previously set character in the plot at a certain point in time. Whether it's the characters or the story or other details of the episode, much of the information is diverse, and sometimes the audience can't really get the information they want in the interactive content. In the case of characters, when viewers want to fully understand a character's personal information, attributes or relationships, they still need to consult outside sources. So the interactive function is not perfect at the level of information provision.

3.3. Elements of Storytelling

The book "The Four Elements of Storytelling" written by Klaus Fog and others [21] explains the 4 main elements of story writing.

3.3.1 Message

The first is about "message", which means that any story must convey a central message to the audience. There needs to be a guiding idea. The book cites the central message of the classic story "Romeo and Juliet": "true love can overcome death". It emphasizes that each story should have just one central message and that too many messages in one story might confuse the audience.

3.3.2 Conflict

The second part is about Conflict. The book states, "Conflict is the driving force of a good story. No conflict, no story." The book argues that the need to set up the Conflict in the story is because human nature tends to seek harmony and balance in life, and when this harmony is disrupted, or there is a sense of crisis, people will try to find solutions and act. For example, if a restaurant always has enough ingredients to serve its customers, it can operate smoothly without a story, but if one day there are not enough ingredients, then the signal of a possible conflict comes, and people will take various measures. Stories are thus

born. Stories attract audiences because they satisfy the emotional need to bring order out of chaos.

3.3.3 Characters

The third coming element is about the character. The book argues that while conflict can bring a story to a turning point, “but in order for this conflict to play out, you need a cast of interacting and compelling characters.” In the Western tradition of storytelling institutions, each story has several specific characters who complement each other through interactive behaviour to enrich the whole story. Generally, a conflict requires a hero and an opponent with opposing purposes. The Conflict in the story is resolved through a struggle with the adversary. Audiences need to fully understand the identity of the characters in the story to substitute themselves into the character. In the conflict resolution by the characters, audiences can also sincerely appreciate the exciting nature of the story. However, the audience must be able to identify with the values of the characters and the problems they face to understand the story. Therefore, if writers want the audience to understand the story, it is crucial to design characters for the target audience. The characters they design shall share the values of the target audiences and have relevant experiences they might be able to imagine.

3.3.4 Plot

After the “message, conflict, and characters” are ready, it is time to consider the development of the plot. Stories can usually be divided into 3 phases: beginning, middle, and end. There is also a more complex flow of story advancement in more comprehensive stories. The book argues that “the escalation of the conflict and the development of our hero drives the story forward, building up to a climax” [21]. As in Hollywood movies, the climax is usually a scene in which the hero and the villain confront each other. Moreover, the end of the Conflict also represents the end of the story. It shows a meaningful connection between these elements, and the characters are even more indispensable to shuttle through the entire story.

3.4. Related Work

3.4.1 Interactive TV

The concept of interactive TV first appeared in 1953 with a children's TV show called "Winky Dink and You". Parents prepared a transparency for their children to place on the screen and interact with the people on the show by drawing with crayons. However, the series was discontinued as children began to draw directly on the TV screen. After that, interactive TV was first commercially available in December 1977. The world's first commercial interactive television service, Qube, opened in Ohio, offering 30 channels divided between broadcast TV, pay-per-view and interactive programming. Despite its popularity, it is not a commercial success¹. Broadly speaking, interactive TV (iTV) includes two functions: storytelling function and social interaction support function [22]. This paper mentions ShapeShifting TV, which is a paradigm of interactive programming. It has prepared material to record and perform an interactive screen media narrative. ShapeShifting TV tries to link narrative and interactivity. And character narrative and interactivity are not inherently opposed to each other; rather, with the right technology, interactivity can add to the power of storytelling. So the use of interactivity to help viewers better understand the story is valid.

The concern that comes with interactive TV is the disruptive nature of the viewer. If complementary information appears while the TV is playing, it may not only not help viewers enhance their viewing pleasure, but also reduce the viewing experience. The paper "A model for Interactive TV Storytelling" [23] mentioned that the challenge of interactive storytelling systems is to generate coherent stories as users watch and intervene in what is happening. In an interactive TV environment, the quality and variety of narratives are crucial goals. In addition, new requirements related to the comfort, responsiveness and scalability of user interaction must also be taken into account. The authors design a model for interactive TV narratives that allows users to engage with TV content without having their immersion disrupted. This interactive approach also needs to consider that different types of content, or different levels of intervention fre-

1 ITV <https://www.theguardian.com/technology/2001/apr/05/onlinesupplement5>

quency, should be provided for different types of customers. Some users may want to remain essentially spectators, willing to have little interaction with the story. Others are prepared to intervene constantly in the story and actively participate in the development of the storyline. The future topic is therefore the need for interactive features to also provide more than one way to accommodate different levels of intervention in the story.

3.4.2 Second Screen Companion Apps

With the merger of television and digital technology, more and more studies show that the "second screen", is gradually accepted and applied in the TV drama market. One example indicates the app "offers extra information about a television program, often synchronized with what happens on screen. " [24] One of the earliest explorations of the integration of second devices and TVs was the study of real estate prototypes using PDAs that allowed users to browse and select information on the PDA while viewing pictures, videos, and detailed maps on the TV screen [25]. The design concept of this study has profound implications for today's "second screen" application research. It suggests that the synergistic effect of dividing the needs of multiple functions across multiple devices can be greater than the scenario of a single device. This was a related area of research exploration that began before smartphones became widely used.

With the introduction of smartphones and tablets, the second screen has become more widely used, and the "TV series companion" application model has been developed. These include Murray et al.'s Story-Map [26], a synchronized iPad application for long-form television narratives with multiple characters and story lines. The app supports character and storyline positioning in a fictional world and provides reminders of story development, as well as enabling recaps of key scenes, among other things. Many broadcasters have experimented with similar companion applications alongside television programs. Also, Basapur et al [27] developed and evaluated a companion app generated by viewers' social circles, which provided synchronized content updates around TV shows. The results of the study showed that creating social circles made participants feel better connected to the TV program and their social life around the TV content was enriched.

A Conference paper mentions a approach called StoryLine [28], it is a timeline

based approach that logically sequences and integrates stories by importing a rich library of existing resources. In environments with complex stories, this system can also filter and arrange multiple timelines into several clear story lines. Even with complex character relationships, viewers can use this system to sort out the plot clearly and will always put it into the point in time they want to reshape. This is an integrated solution for the integration of character relationships and storylines. In addition, this system also has a "multiform interaction" program. This is often referred to as an interactive feature, where different options are available for a particular scene of the story. And it provides a way to replay individual scenes and juxtaposed variants without losing track of the results of previous choices.

The introduction of a second screen can lead to a large degree of "distraction", making it difficult to access the information on the second screen seamlessly in real time while watching. This is to some extent detrimental to the user experience.

Chapter 4

Methodology

4.1. Character Cards — A Combination of External and Implantation Type Information

4.1.1 Introduction

Character cards are information delivery solutions that combine detached external information with integrated interactive information. It focuses on the characters and creates card content that is relevant to the characters and integrated with the plot. The content of the cards is based on the original work. The content is not stored in a fixed location for audiences to look through, but is integrated into the video so that audiences can interactively click on and look up information about specific characters they are interested in. As a result, a relatively accurate answer are expected be given to the audiences if there are any parts of the characters or plots they are not understood.

It assumes that there is a level of comprehension to the TV series story, and if it exceeds a certain level of comprehension, it is considered that the audience can watch the TV series without any obstacles. If it is below this level, this audience needs some aid to help him/her understand the plot and keep up with the overall rhythm while watching the TV series. This research found that the story is the crucial part of creating a TV series, and characters are the crucial part of creating a story. Therefore, this research focuses on the character creation component of TV series creation. It uses “characters” as a breakthrough point and provides a new design that helps audiences quickly understand the plot. That is why the concept of ”dynamic character cards” was introduced here.

“Dynamic Character Cards” can be implemented to locate characters to a pre-

defined “character relationship map” through face recognition technology and display different content about the characters according to plot changes.

As the plot develops and the number of characters appearing increases, the [content of character cards] will be changed dynamically, and [their relationship with other characters] will be shown gradually to the audience without revealing the plot.

4.1.2 Why does it have to be the Card

First of all, why must be designed “Character Cards”. Because the character cards are logical and easy to understand for audiences with different levels of understanding. Secondly, the core axis of the form of the card will be integrated information, this core axis that is the character, not only for the overall plot of the grasp has a certain role, but also effectively do the MECE, that is, the information is not repeated not omitted. This is a very effective form for information collection.

Secondly, this design has the content richness and source stability of “External type information”. At the same time, it can effectively solve the problem of “passive acceptance” of external information. The audience can exercise their own subjectivity in accessing the information on the character cards, i.e., they can choose the information they are really interested in to access and interpret.

Thirdly, the character card design has the advantage of logical and systematic integration of information, while giving the audience “initiative” in the interactive function of implantable information. Because each card is based on a character as the core axis, the audience first has a question or curiosity about a character, which triggers the character card’s information provision function. The uniqueness of this design is that it gives the audience the option to receive information and, to the extent possible, delivers a logical framework of information that is easy to understand.

Fourth, the character cards do not just end around a character providing information, there is a function associated with other characters. This means that a dynamic character relationship map is introduced and gradually expanded around the target character. If the information provided by interactive TV is a “point” concept, then the information received by audiences is fragmented, but the design of the character card is to integrate the information into a card with the charac-

ter as the axis, and the fragmented “point” information is gathered into a small “point” with one character as the center. The information is gathered into a small “area” by a character. Then, through the character relationship diagram, which gradually reveals the content, this character is related to other characters, and the card is linked into a “line” from “point to area and then to line” logic, which is the essence of the character card design.

Last but not least, the card is “dynamic” in nature. Even for the same character, the content of the card will be different when you choose to view it at different points in time. The charm of a TV series is that the audience has an expectation of what will happen next. An important starting point for maintaining the appeal of a TV show is to find ways to keep the audience looking forward to what happens next with the characters and the story as a whole. How much information about the characters’ cards should be disclosed to the audience and in what pace is the key to the success of the card. Therefore, the design will edit the content that needs to be changed according to the different time points of the plot and characters, so that the content of the cards will be presented in a way that just helps the audience understand the story without involving spoilers. This “dynamic” feature also allows the audience to be more involved in the interactive features.

4.1.3 Contribution

The research finally discovers that the narrative ability of a story is the key to whether a TV series is engaging or not. The characters are central to how the story can be narrated. Many audiences do not enjoy the TV series and abandon it because they cannot understand or remember the characters, including their looks, backgrounds, and changes in status as the plot progresses. Therefore, the research will cover a methodology of understandable storytelling based on characters’ status changes. The “dynamic character card” design based on the methodology can help audiences take character development changes into control by checking them at any time during the viewing process. It will help audiences better understand the plot and enjoy watching various TV series with complex logic and character settings.

The character card helps audiences to solve all their questions about the char-

acters, including basic information about the characters, facial recognition, and even changes in the characters' status development associated with the storyline, etc. With the aid of this card, audiences can not only have a clearer understanding of the characters, but according to the practical data below, more than 3/4 of the users have also improved their understanding and grasp of the overall plot after improving their understanding of the characters. And thus realizing that this is what makes the work so interesting, also inspires audiences to want to continue watching the next episode. This shows that the character cards not only help to improve the understanding of the characters, but also play an important role in driving the audiences' interest in the whole series.

4.2. Overview of the Methodology

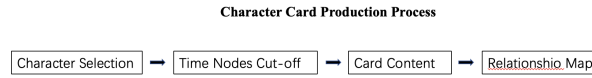
This study designs a methodology for the production of dynamic character cards. Based on the dynamic nature of the cards and the character-centered function, we defined three elements for card creation, namely "Time, Character Content, and Character Relationship".

The first step is to select the character as the object of the card. The methodology for selecting characters is described in the following section.

Secondly, since the cards are dynamic, we need to change the content of the cards at different points in time, so we need to capture different time points in each episode and filter them. The following section will also mention the diagram and perform the screening of time points.

Third, the card content filling step, we designed a set of framework for filling the content based on the basic intelligence of the characters and the dynamic and static state changes.

The fourth is the character relationship diagram, which includes a full set of character relationship diagrams and a dynamic character relationship diagram that is split into parts and gradually exposes more content as the story progresses in the character cards. A description of the production method and presentation process will also be given as a hint below.

Figure 4.1 *Card Making Process*

4.3. Required Parameters for Card Making

4.3.1 Timing

Because of the dynamic nature of the cards, the content of the cards changes as the characters and the plot develop. So where exactly the changes occur becomes one of the factors to consider when creating the cards. Here we introduce the concept of “dynamic Time Nodes” , when making cards, we need to intercept and list out the time nodes where the plot and characters’ status change significantly according to the “storytelling theory” , and then combine the content elements contained in the cards to filter out the content that is important to the plot. Then, we select a few time nodes that are significant to the understanding of the plot as the locations where the content of the card changes.

4.3.2 Character

When it comes to character cards, the role is necessarily the most central and major part. First of all, the selection of characters, because it is impossible to make a set of character cards for each character, we need to choose the characters that have a relative influence on the plot. Here we will list several indicators for selection.

- According to the number of episodes and length of appearance

Usually we determine that the “influential” characters should have no less than 20% of the total characters. So we can calculate all the characters and their appearance time, remove the least 20% and make character cards for the remaining characters.

- Filter by the cast list in the table of contents

Usually there is a cast list at the end of a TV series, and this is usually sorted by the importance of the characters in the plot. We still follow the two-eight principle and select most of the characters in the first 80% to make character cards for them

- Special case: the role of clues

There are some characters who appear in less than 20% of the total, and are in the very back of the cast. If he belongs to the role of “clues” in the play, to promote the plot has an important role, but still should be made a special character card, this situation needs to be based on the specific plot to do specific analysis.

4.3.3 Relationships

Character relationships are also a very important part of the character cards. We used the concept of “clusters” to create an easy-to-understand character relationship diagram by choosing a fixed conceptual axis for each TV series. The character relationship here is not only a general picture of the relationship between all the characters, but the innovation of this design is that there is a process of gradually revealing the Character Relationship Map. Starting with each character, as the story progresses and the character grows, his relationship with other characters is gradually revealed. This gradual revealing process can enhance the interactivity, which is also the highlight of this design.

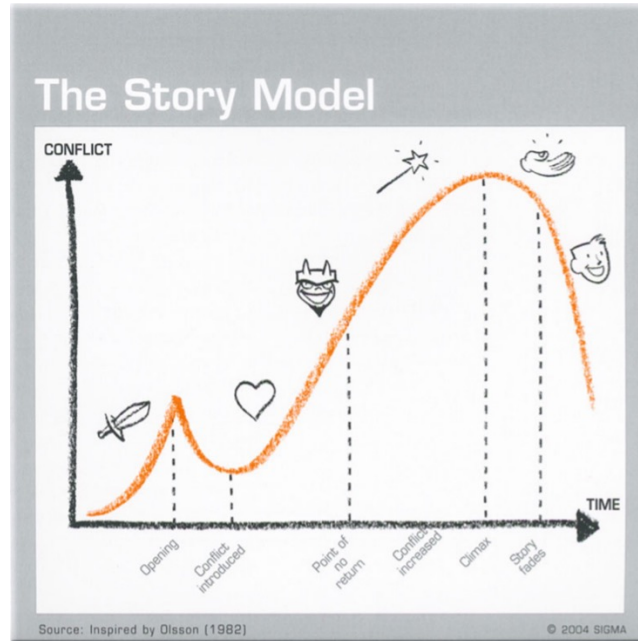
4.4. Time: Time Nodes Cut-off Method

The methodology of cutting off the time nodes follows the two general directions: “Plot-driven” and “Character-driven.”

4.4.1 Plot-driven Method

Plot-driven is based on the story model as shown in Figure4.4.

There are different stages in both the plot development and the characters’ change. According to the book “The Four Elements of Storytelling” [21], the



(Source: "The Four Elements of Storytelling" [21])

Figure 4.2 *The Story Model*

story's development is usually such a process: it is a process from calm to encountering problems, and then the characters take measures to solve the problem. Furthermore, it reaches a climax, and the problem is solved and returns to calm. Several time nodes accompany each stage. This research defines them the temporal nodes of the story, which symbolize the changes and turns of the plot. Several time nodes accompany each stage. This research defines them the temporal nodes of the story, which symbolize the changes and turns of the plot. This study advocate to collect these nodes and analyze the ones that have significantly impact of plot understanding. Then, it sets the nodes as where the character cards content change.

However, the characters drive the changes in the story model curve. As elaborated in the book, the hero needs to perform decisive actions to influence the plot's development and the story's outcome [21]. Characters have a significant impact on the advancement of the story plot. From this, we can assume that if the audience has a clear and explicit understanding of the characters, it will

enhance the understanding of the plot and even the whole story. Therefore, this design focuses on character specifically.

4.4.2 Character-driven Method

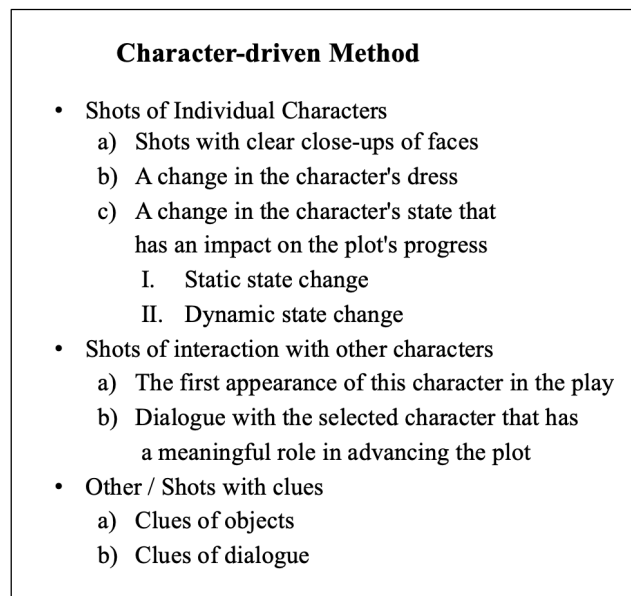


Figure 4.3 *Framework of Character-driven Time Nodes Cut-off Method*

Character-driven indicates individual characters and shots of interaction with other characters. The following framework was designed for this research.

- Shots of Individual Characters:
 - a. Shots with clear close-ups of faces
(Usually, there are close-ups to attract the attention of the audience, then a high probability will provide important information related to the development of the plot)
 - b. A change in the character's dress
(Many stories suggest a plot change or alert the audience to some new information by showing the scene the characters change costumes)

- c. A change in the character's state that has an impact on the plot's progress
(Between these nodes, the plot changes while the characters' states naturally change in big and small ways. These include overall static state changes and intuitive, dynamic behaviour changes.)
 - (a) Static state change
(It refers to a character's state during a period. It includes the state of mind and life and emphasizes the continuity within a period.)
 - (b) Dynamic state change
(It refers to the intuitive changes in behaviour made by the character. It is immediate and short-term.)
- Shots of interaction with other characters
 - a. The first appearance of this character in the play
 - b. Dialogue with the selected character that has a meaningful role in advancing the plot
- Other / Shots with clues
 - a. Clues of objects
 - b. Clues of dialogue

4.5. Character: Card Content

After selecting these necessary time cut-off points, we fill the character cards with a unit between each time node. The method is based on the elements that affect the understanding of the story, break down the story of what happened to a character in a certain period, build a framework for the cards, and fill in the relevant content. The following framework was designed for this research.

- Characters' Basic Information
(Basic character information can give the audience an overall understanding of the character, helping the audience to grasp the character. For example, when building a house, the basic framework, after having the following details to fill in the pavement.)

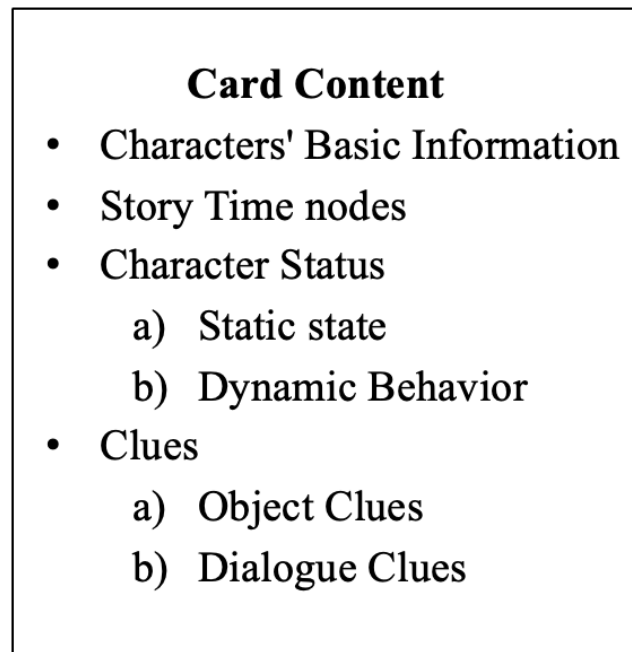


Figure 4.4 *Framework of Card Content*

- Story Time nodes
- Character Status

(Between these nodes, the plot changes while the characters' states naturally change in big and small ways. These include overall static state changes and intuitive, dynamic behaviour changes.)

a. Static state

(It refers to a character's state during a period. It includes the state of mind and life and emphasizes the continuity within a period.)

b. Dynamic Behavior

(It refers to the intuitive changes in behaviour made by the character. It is immediate and short-term.)

- Clues

(For story creation, different clues are interspersed in the plot between the various changes in the characters. They are part of the plot's development and can enhance the viewing pleasure to some extent. It can include "object clues" and "dialogue clues")

a. Object Clues

(It refers to a particular item that appears in the play and can be a hint of some future plot development.)

b. Dialogue Clues

(It refers to the dialogue between the characters. Some clues about the development of the plot might be hidden in the characters' dialogue.)

4.6. Relationship: Character-relationship Map (CRM) Creation

Analyzing the commonalities among characters makes it possible to find an axis through which to group characters and design their relationship maps. Here it will point out the concept of grouping and discuss why it is necessary to group characters. A cluster is a group of people with the same commonality, influencing their common interests. In a TV series set, a good cluster is not just one that brings people together but one on which they can create Synergy, maximize their shared interests, and effectively drive the plot forward. In scriptwriting, the characters seem to have their characteristics, but on the face, they have much interconnect- edness with each other. The clustering of characters in the script contains several features as below.

Interdependence

A group is composed of individuals, including more than one individual. However, it is not only composed of individuals, but individuals must rely on each other to maintain the group's existence and achieve common goals. In essence, inter- dependence is the recognition by those in a group of their need for the others in the group [29]. Imagine a company with only one person who cannot match the

size of a company with multiple employees and reasonable distribution of tasks. Moreover, a company with multiple employees whose businesses do not intersect and never need each other's support cannot be considered an organization. In a TV series story, one of the essential points for grouping characters is whether the characters in the group are related and interdependent.

Commonality

a. Common Goals

The existence of a group is relatively meaningless if its members are merely interdependent but do not share a common goal. The members of a group are all brought together for the same reason or purpose. Although most members of a group have different individual goals, what brings them together must be the existence of a larger collective goal that transcends individual goals. A common goal is also a necessary element for a group to be formed. For example, if the employees of different departments of a company come together, although different departments have different purposes and performance evaluation methods, the overall shared goal is the company's profitability. Therefore, the formation of groups can be from individuals to teams, from teams to divisions, and finally from divisions to the whole company. In TV series, grouping characters also necessarily requires finding a common goal in tandem.

b. Shared Norms

People form groups because they have common goals and develop standard norms to help them achieve them. Even if there are goals, random interactions among members without norms do not indicate that they are a group. It requires a set of norms developed and accepted by all members to guide collective behaviour. For example, the company sets commuting times, meeting times, Etc., and the employees implement the implementation tacitly. When grouping characters in a TV series, audiences can refer to whether the group they form has a set of rules that are not legal but that all group members carry out in an orderly, unspoken, and regular manner.

Interaction

There must be group interactions, yet not all can be called effective. Cragon, Wright and Kasch [30] state that the primary defining characteristic of group interaction is purposeful. Roles, norms, and relationships among members arise through interaction, and a proper group does not exist without purposeful interaction. For example, if the employees of a company get together every week, meet and confer, this is to work together to solve a particular problem that affects the common interests of all of them; this is purposeful interaction to achieve a common goal. It is especially true in TV series stories. The interactions between the characters are presented with a purpose, mainly to move the plot forward. Therefore, when grouping characters, it is necessary to consider whether the interaction between the characters in the group is strong enough.

Cohesiveness

It is a feeling of group cohesion among group members. When group members feel part of something larger, they experience a sense of cohesion or wholeness and may find a larger purpose than their desires and goals. This sense of connection and participation sets interaction in a group apart from the defined interaction between loosely defined individuals. This members' belief is also an essential part of what keeps the team in existence. In TV series stories, no matter how the characters are grouped, their belief in the sense of wholeness is intrinsic to the bonding between the characters and has a positive effect on the advancement of the plot.

Synergy

“The whole is greater than the sum of its parts.” It is the very idea of Synergy [31]. It explains as the combined strength of everyone in the group yields a result more excellent than the sum of the individuals. The analogy can be made with an orchestra, where each instrument is beautiful when played individually, but a good orchestra is one in which all the instruments add up to a more beautiful harmony, outputting a result that is greater than the sum of the individuals. Put in a TV story is that even though each character has their characteristics and

shining points, they only come together to form the community to make the story truly fleshed out.

4.6.1 Division Axis for TV Series

When applying the theory to the clustering of characters in TV series, the approximate classification can be as follows.

Emotional axis

According to the story setting, the characters are divided into different groups according to their emotional connections. Such as family group, love group, friendship group, Etc. In addition, if the message the story delivers and the conflict in the story has been related to some emotion, including family, love and friendship, then according to these elements, it would be a great way to choose the emotional axis to create the character relationship map.

Family Axis

According to the story setting, the characters are divided into different groups according to their family structures. For example, several families are sometimes set in the story, they are jointly involved in the plot's conflict, and the characters between several families have inextricable interests and emotional connections. Plus, if the story's message is also closely related to several families. It suggests choosing the family axis for creating the character relationship map.

Age Axis

According to the story setting, the characters are divided into different groups according to their family structures. If a TV series involves a significant period, mainly if it contains a large age span of the main character, then it suggests using the age as the axis to sort out the character relationship map.

4.7. Face Recognition Technology

If audiences are in doubt about a character during the movie, click [Pause] and then move your mouse around the character's face. A box will appear, and the automatic face recognition function within the program will be activated. After successful recognition, it will display the content of the character cards and a sketch of the character's relationship to the character that has appeared up to this point in time. If audiences want to locate the overall character relationship map, audiences can also use the advanced function to locate the overall character relationship map and only show the character relationships that have already appeared. Other characters that have not yet appeared in the story will be hidden.

Face recognition process breakdown.

Face detection and analysis

First, it detects whether the frame contains a face and returns the face's position, facial attributes, and quality information. Based on what is documented in Tencent's face recognition technology documentation, Facial attributes include gender, age, expression, beauty, glass, hair, mask and pose (pitch, roll, yaw). Face quality information includes overall quality score (score), blur score (sharpness), lightness score (brightness) and five senses occlusion score (completeness). [32].

Facial five senses localization

Five senses positioning is performed on the requested image to calculate several vital points that make up the contour of a human face. Also, according to Tencent Cloud product documentation, facial contours can be divided into 90 points, including eyebrows (8 points on each side), eyes (8 points on each side), nose (13 points), mouth (22 points), face contour (21 points), and eyes or pupils (2 points). [32].

Face Database Management

Establish a person database, input all the roles in the personal relationship diagram into the person database, and store person-related information (face features, ID, Etc.)

Face verification and comparison

Compare with the faces previously entered the person database through the person diagram to find the matching faces with the most compatible facial attributes, and thus make identity speculation.

Face Search

If multiple similar faces are identified in the people database, the dismissals can be sorted by similarity from largest to smallest.

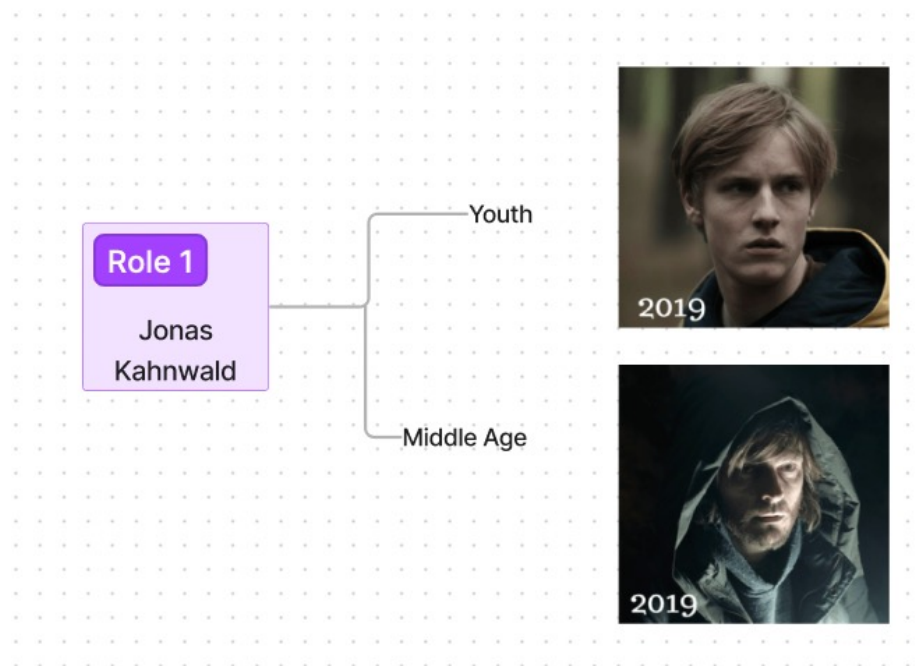
Chapter 5

Application

5.1. Case Study: TV series *Dark*

Design Character Cards

Step 1: Define the character: The role of “Jonas Kahnwald”



(Headshots Source: Netflix Drama *Dark*, Netflix Japan Official Website [8])

Figure 5.1 *Jonas Kahnwald*

Step 2: Define the episode: Episode 1**Step 3: Time Node Creation based on the role of “Jonas Kahnwald” in the first episode**

- 2'50"
Selected character Jonas appears in the play for the first time.
- 06'48"
yellow clothes with suggestive attributes, set against one of the suggestive scenes that follow
- 07'48"
First conversation with the psychiatrist, Peter Doppler. First appearance of the psychiatrist Peter Doppler in the play.
- 09'05"
An important suggestive object, the “suicide note letter”, appears. Ines Kahnwald appears for the first time in the play. There is no need to update the character map at this point because the audience does not need to know who she is in the play and how she relates to the main character at this moment. If audiences know, they might be less interested in exploring the plot and enjoying the rest of the story.
- 12'13"
The first shot of Jonas returning to school, meeting and interacting with her best friend, Bartosz Tiedemann. Bartosz Tiedemann appears for the first time in the story.
- 16'20"
Turning shots where the character's state changes. It is shown through a close-up shot. Then, it will move to shots of interactions with other important characters.
 - a. Static: He moves from a state of mental healing to a state of returning to school.
 - b. Dynamic: He is returning to school after a few months' absences.

c. Interactive shots: dialogue with a close friend, Bartosz Tiedemann and an ex-girlfriend, Martha Nielsen. Martha Nielsen appears for the first time in the play.

- 21'13"

interactions with other important characters. Discuss the evening gathering at the cave entrance in the campus hallway with a close friend, Bartosz Tiedemann.

- 29'40"

Turning shots where the character's state changes. It is shown through a close-up shot. Then, it will move to shots of interactions with other important characters.

Dynamic: He wakes up from a dream, suggesting that something is about to happen next.

- 39'19"

An incident occurs where an important character, Mikkel Nielsen, is lost, a significant turning point that drives the plot.

Then, the following 4 time nodes are selected based on the “understandable storytelling elements” and “the occupation of the above elements”. To help understand the plot and play an essential role in promoting the story's development. So, the content of the character card changes at these 4 time nodes in the first episode as seen in Figure 5.2.

Step 4: Card Content Filling

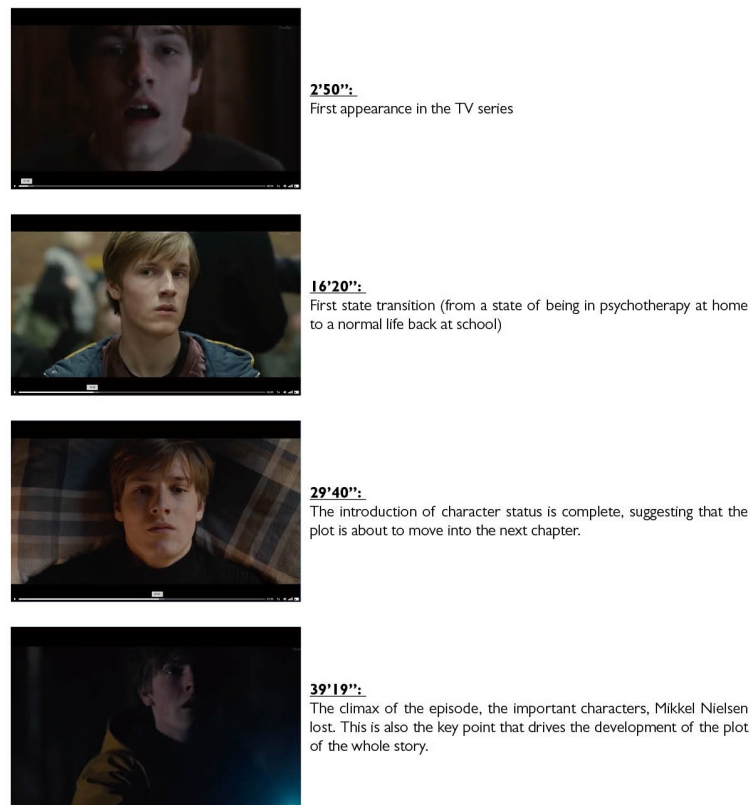
When filling out the cards, the story can be broken down into several significant frames for the audience to understand the story more quickly and clearly.

- Role name:

- Time :

The play involves time travel, and the story has three different timelines.

- Location:



(Screenshot Source: Netflix Drama *Dark*, Netflix Japan Official Website [8])

Figure 5.2 *Netflix Drama <Dark> Season 1 Episode 1*

- Age group:

Since the same character in the play will appear in different age groups):

- Status:

- a. Description of static state
- b. Description of dynamic behaviour

- Clues:

Many TV series s need clues to advance the plot, especially for suspense TV series. As this is a suspense TV series, it has set up many clues interspersed throughout the story.

- a. Physical clues
- b. Character dialogue clues

Card contents at the 4 time nodes as seen in Figure 5.3.



(Headshots Source: Netflix Drama *Dark*, Netflix Japan Official Website [8])

Figure 5.3 *Card Contents*

Step 5: Create a partial character relationship map

Method: Show audiences a small map of the relationships without revealing too much about the plot.

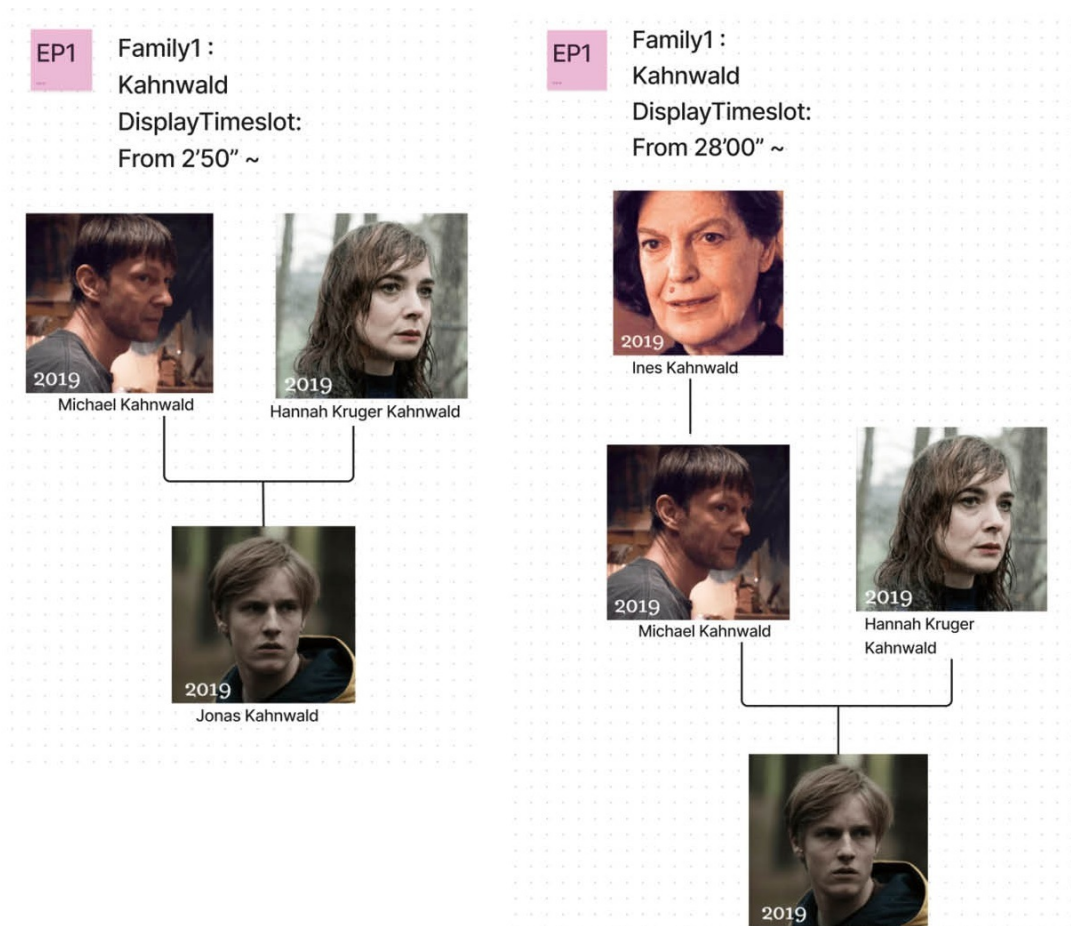
1. Collect all characters that have appeared in the TV series before this node.
2. Briefly record the story between this time node and the previous time node.

3. Filter out the characters closely related to the target character in the episode and present only the relationship graphs of these selected characters.

For example, in the first episode, even though the cards present different content at 2'50", 16'20", 29'40", and 39'19", the new character Ines Kahnwald, who is revealed to be related to the target character Jonas Kahnwald, appears as a member of the family only after 28'00" and appears on the character relationship chart in Jonas' character card. Even though Ines Kahnwald's first appearance in the story is at 09'06", if her identity and relationship with the central family were explained to the audience at that point in the story, it would reveal too much information to the audience too early and would spoil the audience's desire to explore the future of the plot as seen in Figure5.4.

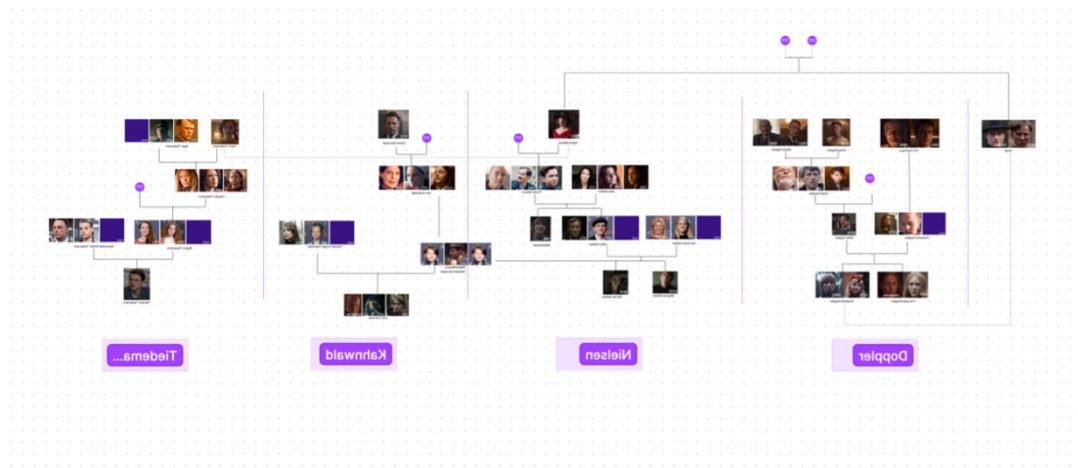
5.2. Character Relationship Map(CRM)

In this work, we choose [family axis] as the basis for grouping because the play is centred on the four families in the town and their complex character relationships. These four families are all associated with several missing children's cases, and from these disappearances gradually unfold to see the intricate relationship between the characters of several families. These characters interact with each other in different times and spaces, gradually driving the plot forward. Therefore, using the family as the axis can clearly show the characters and their relationship with each other and the difference in time for the audience through the layering of different grandparents, which provides more layers of information for understanding the story as seen in Figure5.5.



(Headshots Source: Netflix Drama *Dark*, Netflix Japan Official Website [8])

Figure 5.4 *Partial Character Relationship Map(CRM)*



(Headshots Source: Netflix Drama (*Dark*), Netflix Japan Official Website [8])

Figure 5.5 *Whole Character Relationship Map(CRM)*

Chapter 6

Evaluation

6.1. Experiment Approach

We selected 20 experimenters (10 men and 10 women) of Asian origin between the ages of 20 and 35.

We consider the “four elements of storytelling” — information, conflict, character, and plot, to design a set of questions. The experimenters watched the first episode and filled in the questions before and after using the character card tool.

It includes both subjective and objective questions, and we compare the answers before and after using the character card tool. This experimental method is conducive to obtaining more objective and convincing data. The specific steps can be referred to as follows.

1. Select a 20 experimenters of Asian origin with 10 males and 10 females.
2. Watch the first episode without any aids, using native language subtitles.
3. After viewing, they answer a questionnaire to test their understanding of the plot and characters and ask if they are interested in continuing to the next episode.
4. A second viewing was conducted, showing the hero’s character card and character relationship map at four points in the episode.
5. After viewing, answer the same questionnaire and compare the test results to see if the level of understanding of the episode has improved. Again, ask if you are interested in continuing to watch the next episode.

6.2. Survey Questions

6.2.1 Subjective Questions

1. After watching the first episode, how much do you feel you have understood subjectively?
 - a. Completely understood (100%)
 - b. Mostly understood, but a small part did not understand (75%)
 - c. Understood half of it (50%)
 - d. Only understood a little (25%)
 - e. Didn't understand it at all (0%)

2. Would you like to continue watching the next episode?
 - a. Yes
 - b. No

6.2.2 Objective Questions

The following questions are asked when audiences finish watching the first episode. It aims to evaluate how much the audiences has been understood the story.

Regarding the "Message":

1. what message do you think the play is trying to send to the audience?

Regarding the "Conflict":

2. what do you think is the biggest conflict of the play?

Regarding the "Characters":

3. How many families do you think the play is about? If you can, please list the names of the families.

4. Please introduce the following characters in one sentence. (Jonas Kahnwald and Helge Doppler)
5. Please select the characters who have interacted with each of the above characters and write down what you understand about their relationship. (Select from a list of 13 main characters appeared in the first episode)

Regarding the “Plot”:

6. how many children are missing in the first episode?
7. whose children, are they?
8. what is the purpose of the school’s parent-teacher conference?
9. why did the high school students gather in front of the cave at night?

6.3. Categorize the Result and Analysis

6.3.1 First Viewing without any Supporting Tools

Subjective Answers and Analysis (First Round)

This result (refer to 6.1 and 6.2) suggests a positive correlation between the level of understanding of the story and the interest in continuing to watch the next episode. Subjectively, the higher the level of understanding of the story, the more likely the audience will be interested in the next episode. So, if the creative team of a TV series wants to attract viewers to keep watching, then finding ways to make audiences understand the story better shall be an important area to figure out.

Objective Answers and Analysis (First Round)

Although the questions were in the form of competent answers, each question had a correct answer consistent with the plot. We divided the correctness statistics for each question into five bands (0%, 25%, 50%, 75%, 100%) For questions requiring

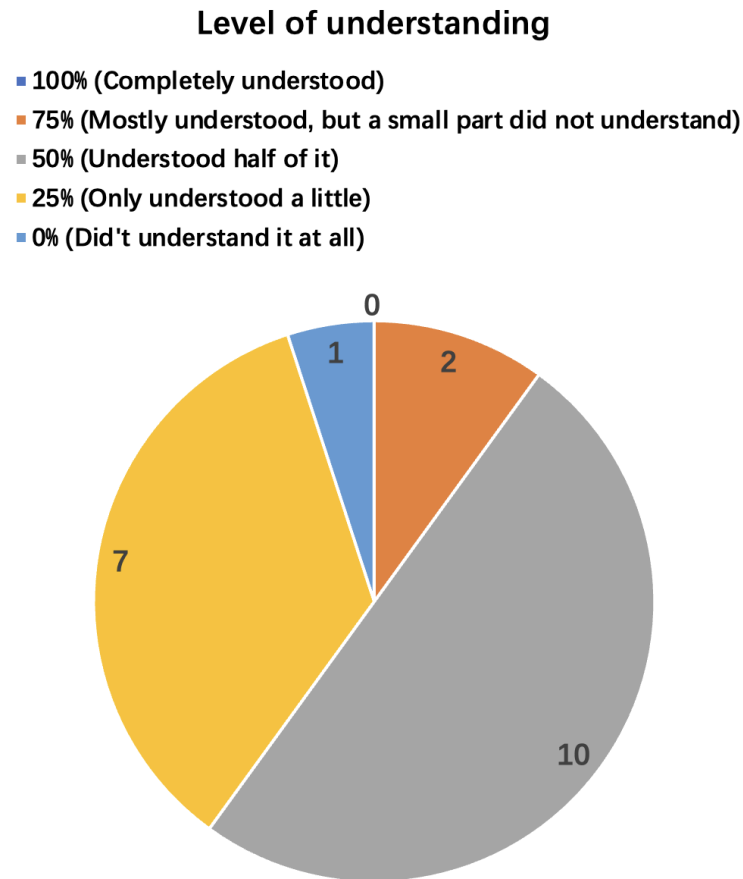


Figure 6.1 *Number of Experimenters at each understanding Level*

subjective exposition, we grammatically disassembled the correct answers, identified the subject, predicate, and object, extracted the keywords necessary for the correct answer, and then compared them with the experimenters' answer.

Criteria

The criteria are as follows:

0%: The meaning is entirely different from the correct answer, and the keywords are incompatible.

Whether Wants to Watch the Next Episode?

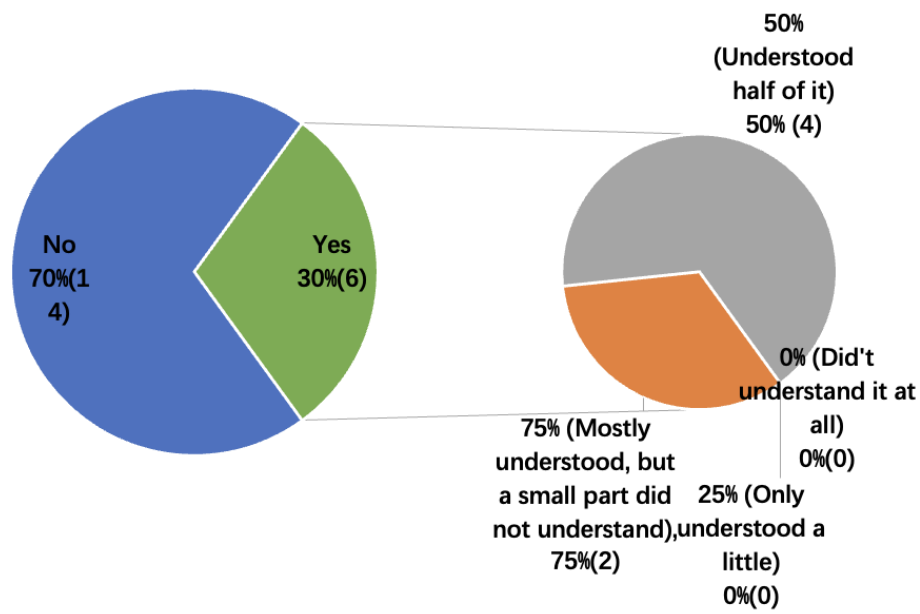


Figure 6.2 *Number of Experimenters selected "YES" at each understanding Level*

25%: The meaning is ambiguous, and there is a significant deviation from the correct answer has a significant deviation the keywords are primarily incompatible.

50%: The meaning is ambiguous, and there is a deviation from the correct answer, but half of the keywords are incompatible.

75%: The meaning is clear, but there is a slight deviation from the correct answer, and the keywords have a small part of incompatibility.

100%: The meaning is clear and consistent with the correct answer; the keywords are compatible.



Figure 6.3 *Number of experimenters Get 100% correct Answers for each section*

The statistics (Refer to Figure 6.3 and Table 6.1 , 6.2 , 6.3 ,6.4) are the objective score of the experimenters in each section, based on the subjective selection of experimenters with different levels of understanding.

Table 6.1 Group of 75% Understanding Level

Participants	Regarding the message	Regarding the conflict	Regarding the characters	Regarding the plot
A	0%	100%	75%	100%
B	100%	100%	100%	75%

The result suggests that the level of understanding of the “character” affects understanding the plot and the whole story. Whether subjective or objective, the higher the level of understanding of the characters, the better the viewers understand the whole story and their grasp of the plot changes.

Therefore, this confirms the hypothesis that “to enhance the audience’s understanding of the story of a TV series, we can start by enhancing the memory and understanding of the ”characters” .

Table 6.2 Group of 50% Understanding Level

Participants	Regarding the message	Regarding the conflict	Regarding the characters	Regarding the plot
C	0%	100%	50%	100%
D	100%	100%	100%	75%
E	0%	0%	25%	50%
F	0%	0%	50%	50%
G	0%	100%	100%	100%
H	0%	0%	25%	25%
I	0%	100%	50%	50%
J	0%	0%	25%	25%
K	0%	0%	100%	50%
L	0%	0%	25%	25%

6.3.2 Second Viewing with using the character cards demo

Subjective Answers and Analysis (Second Round)

(Results refer to 6.4 and 6.5)

Interview

- We interviewed the 10 people who switched from “No” to “Yes”.

Findings from the results of the interviews:

First, we found that these 10 people subjectively showed a better understanding of the plot after using the character cards.

Some experimenters feel that after using the character cards, they had a clearer understanding of the character’s background and the state of the plot. They also felt that this had increased their interest in continuing to explore the drama.

Some experimenters feel that the “clue” section in the character cards reminded them of details they had missed while watching. These are details that are interwoven into the story, and sometimes a little neglect while

Table 6.3 Group of 25% Understanding Level

Participants	Regarding the message	Regarding the conflict	Regarding the characters	Regarding the plot
M	0%	0%	25%	25%
N	0%	0%	25%	25%
O	0%	0%	25%	25%
P	0%	0%	25%	50%
Q	0%	0%	25%	25%
R	0%	0%	25%	25%
S	0%	0%	25%	50%

Table 6.4 Group of 0% Understanding Level

Participants	Regarding the message	Regarding the conflict	Regarding the characters	Regarding the plot
T	0%	0%	25%	25%

watching can affect the overall grasp of the plot. Therefore, the character cards have the additional important function of “detail reminder”.

- We interviewed the 4 people who still chose “No”.
 - (a.) 3 of them subjectively showed that they had a better understanding of the plot after using the character cards.
 - (b.) 1 of them thinks there was no significant change in their understanding of the plot before and after using the character cards and that they still had a 75% understanding of the plot.

Founds from the results of the interviews:

These three experimenters, who were unwilling to continue watching even though their understanding was improved, did not have a high interest in this suspense drama. Some people commented that the atmosphere of the drama was too dark, and the drama at the cave entrance at night was too

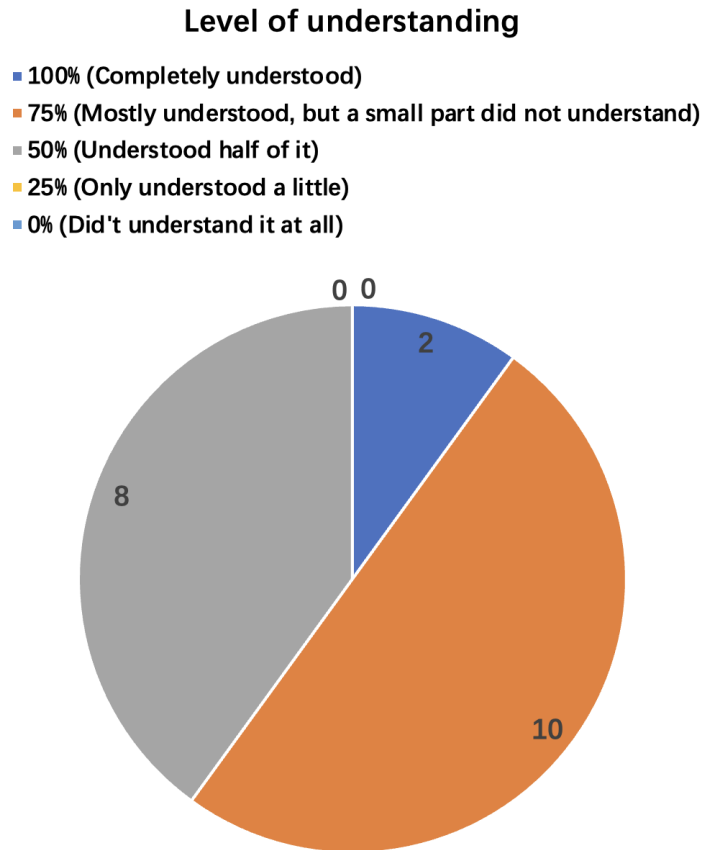


Figure 6.4 *Number of Experimenters at each Understanding Level*

scary to watch alone, so they were not willing to continue watching even though they understood it better.

It shows that the TV series character cards can only work for audiences who are themselves interested in the subject matter of the series. Therefore, character cards cannot help expand the base of the target audience but can only help reduce the loss of viewers due to obstacles in understanding the plot within the circle of the target audience.

In terms of the one whose understanding did not change significantly after using the character card, his understanding of the plot was already as high as 75% in the

Whether Wants to Watch the Next Episode?

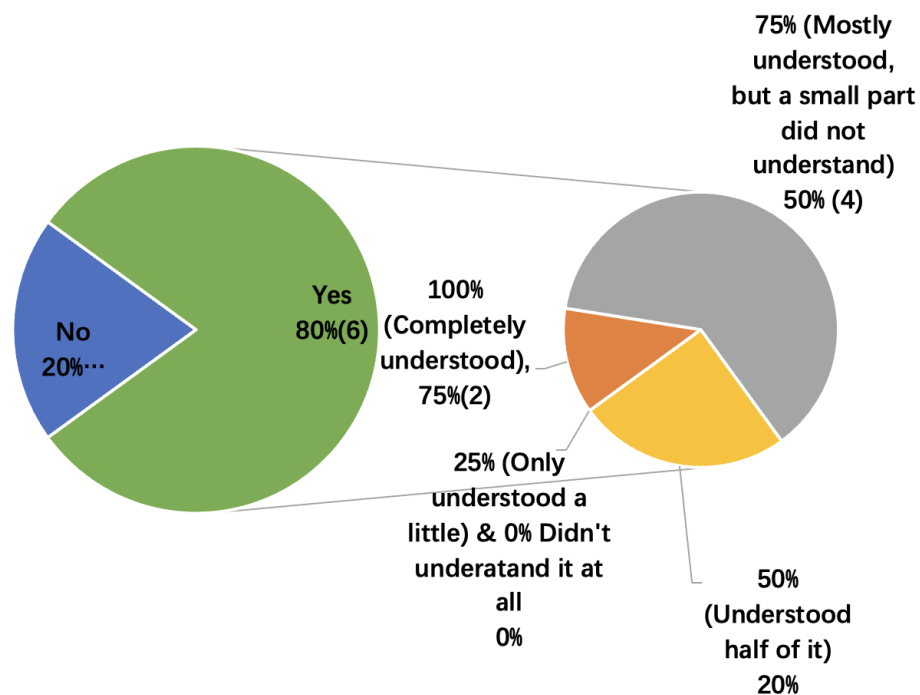


Figure 6.5 Number of Experimenters selected "YES" at each Understanding Level

first test. He has already captured almost similar information as in the character card during his first-time self-watch. So his user experience was relatively low.

It suggests that there is a limitation in the character cards themselves, as the cards' content cannot be customized enough to serve various type of users. So the users who benefit more from the character cards to some extent are limited to those with a lower level of understanding in person.

Objective Answers and Analysis (Second Round)

The results (Refer to Figure 6.6 and Table 6.5 , 6.6 , 6.7) show that the overall scores increased after using the character cards, indicating that the experimenters also increased their understanding of the whole story.

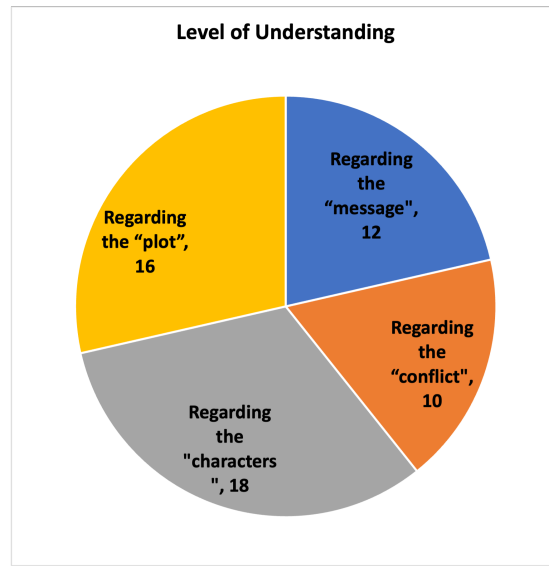


Figure 6.6 Number of experimenters Get 100% correct Answers for each section

Table 6.5 Group of 100% Understanding Level

Participants	Regarding the message	Regarding the conflict	Regarding the characters	Regarding the plot
A	100%	100%	100%	100%
B	100%	100%	100%	75%

All the experimenters understood more than 50% of the story after applying the character cards, which shows that the cards' content gave the audience practical hints and help. It also confirms the theory that starting with the characters is a great help in understanding the plot and the whole story.

Table 6.6 Group of 75% Understanding Level

Participants	Regarding the message	Regarding the conflict	Regarding the characters	Regarding the plot
C	0%	100%	100%	100%
D	100%	100%	100%	100%
E	0%	0%	100%	100%
F	100%	0%	100%	100%
G	100%	100%	100%	100%
H	100%	0%	100%	25%
I	0%	100%	100%	100%
J	100%	100%	100%	100%
K	100%	100%	100%	100%
L	100%	0%	100%	100%

Table 6.7 Group of 50% Understanding Level

Participants	Regarding the message	Regarding the conflict	Regarding the characters	Regarding the plot
M	100%	0%	100%	100%
N	0%	0%	25%	25%
O	0%	100%	100%	100%
P	100%	100%	100%	100%
Q	100%	0%	100%	100%
R	0%	0%	100%	100%
S	0%	0%	100%	100%
T	0%	0%	25%	25%

Chapter 7

Conclusion

7.1. Discussion

The experimental results prove that using the character cards can improve the audience's understanding of the plot. It can help the audience to answer many questionable points in the plot.

The benefits of the character cards can be summarized as follows.

First, they can help the audience overcome the barrier of recognizing the characters' faces. It may not be a problem if the actors and viewers are from similar countries or regions, but if the viewers are from the East and West watching each other's dramas, the facial recognition barrier is a real problem that can hinder the viewers' enjoyment of the drama.

Second, character cards depict characters and remind viewers of important information they missed while watching. Many dramas will have ambiguities in the plot, and for suspense dramas, if the viewer misses a detail, they need to rewind and rewatch it by feel. With character cards, on the other hand, it is possible to more clearly show the essential details that the playwright wants the audience to notice.

Third, the content of the character cards changes as the plot progresses. The content is grasped very strictly to ensure the maximum possible non-spoiler, to bring the audience the right amount of information to ensure their viewing experience.

7.2. Limitation

Based on the experimental results and interviews, we know that character cards have several limitations.

First, a large amount of content makes it inconvenient to read. Some experimenters feel the content of the character cards is too much and requires stopping the viewing the drama to read, which disrupted the continuity of the drama viewing and somehow affects the viewing experience. In addition, there are too many items in the character cards at several points, interspersed with both information that the audience understood or not. However, audiences must read everything; if not, they might miss some critical information.

Second, the card information is relatively too general to meet the needs of audiences' different levels of understanding.

This study used a set of frameworks to sort out the abstract content on the character cards, indicating what to be shown to audiences with a relatively rigid logical structure. However, this information is still of a more general and generalized height. Some viewers who have a specific grasp of the plot desire to know more details that are not easily noticed. However, the cards' content at this stage is too general to meet the needs of all audiences with different levels of understanding.

Third, a slight oversight in the content of the character cards runs the risk of revealing the plot.

Although the cards' content is designed to follow the plot very carefully to show the audience the deeper content gradually because the plot itself is abstract, it may be challenging to grasp the level of display in many cases, and there are different degrees of dramatization. This risk is present in the design of the character cards. In addition, it requires the human brain to think and design card contents, which needs more time and energy consumption. It does not support automated reviews for mass production.

7.3. Future work

For the problem of displaying too much information simultaneously, it is possible to make the design more user-friendly by designing a table of contents and allowing audiences to select the information they wish to expand on. It also adds interactivity and interest to the audience in the selection process.

To address the problem of over-generalized information, one can try to group

audiences with different levels of understanding (0%, 25%, 50%, 75%, 100%) and design and present content for them at different levels. In addition, the intelligence can be improved to guess what viewers with different levels of understanding need. For example, it is possible to collect the time of character cards that viewers stop to view and the characters they view. It can determine the time at which viewers often stop and the characters that are often viewed. Encourage viewers to mark and record their feedback when using the character cards, which will help enrich the data intelligence and improve the accuracy of the card content.

To address the risk of revealing the plot. We hope that in the future, we can explore a methodology for filling card content without the risk of revealing the plot.

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