

# Literature review on the research on games computer science



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This section discusses the literature review on the research on games. The main research in this chapter includes the definition of games, game genres, description of word game and adventure game, formal and dramatic elements in game and the review of existing word game and adventure game.

## 2. 2 Definition of Games

According to Moore (2007), people entertain themselves by playing games when they have spare time. A game has to let player continue playing. There must be

challenge in games. Games can challenge player in many aspects such as physical, mental or both. In physical challenge, a person's strength, endurance or dexterity are tested. On the other hand, mental challenge will test a person's spatial perception, memory and capability in counting as well as logical thinking.

The rules and structure are important in games. Rules decide what the player must follow in order to accomplish the game. The structures determine the order in which actions take place. Furthermore, games are not reality; they are an abstraction of reality. Some games are highly abstracted from reality whereas other games are not as greatly abstracted. Players never confuse the fact that they are not actually living out a game situation.

A computer game refers to a game played using a personal computer.

During the past 40 years, computer games have been played from a floppy disk, CD-ROM, with the use of email, or online through the Internet.

Computer games can be played individually, against the computer, or against other people face-to-face or on-line.

## 2. 3 Game Genres

According to Rabin (2005), game can be divided into several types. Game of the same kind of elements, visual style and method of playing can be group into the same category. Computer games can be divided into different categories including action, role-playing, strategy, stimulation and puzzle.

### 2. 3. 1 Action Games

Action games involve activities with excitement and require fast response. Players may also encounter tactical and exploration challenges, but these games first-and-foremost require high reaction speed and good hand-eye coordination. Player will get themselves in the game and will continuously look for new enemies. Player gets to enjoy the game by responding as fast as possible to achieve the objective of the game. Example of action game is Street Fighter.

### 2. 3. 2 Role-Playing Games

In role-playing games (RPGs), an overall story arc gives purpose to the events in the game and drives the main character toward achieving a goal. The character(s) usually have a number of different game statistics that are used to resolve game actions. These statistics include the character's health, physical attack strength, physical defence ability and so on. Initially, characters are usually weak and improve their statistics over time.

Characters can learn new abilities or skills when they go up a level. During the game, player makes new discoveries such as weapons, armour, magic, spells, potions, and so on. The character's games statistics will be improved by some of these items or provide new abilities for character toward achieving the central quest. As the story develops, the character constantly faces new fantastic creatures and dangerous enemies who assist in the main quest.

Examples of RPGs include Baldour's Gate, Fable, Might and Magic, Neverwinter Nights, Ultima, and World of Warcraft.

### 2. 3. 3 Strategy Games

Strategy games are games that deal with military, economic, and political conflict. It requires player to think through problems, control resources and make strategic and tactical decisions. Strategy games include war games, real-time strategy (RTS) games, and economic/political games. Example of strategy game is Sid Meier's Civilization.

### 2. 3. 4 Simulation Games

Stimulation games are games about management of resources and making decisions on how the resources will be expanded. Some stimulations have real goals such as to reach certain contentment level for the citizenry within a fixed timeframe. On the other hand, some stimulations are more open-ended where it allow the player to experiment freely with the game world. The game might be about building a city or about controlling lives. Sims City is an example of stimulation game.

### 2. 3. 5 Puzzle Games

Puzzle games have rules by which player must abide. Most puzzle games set up an initial problem for the player to solve; some randomness might be involved in the initial setup. Player usually competes against him or herself with no opponent involved in the puzzle games. Example of puzzle games are Tetris or Minesweeper.

### 2. 3. 6 Word Game

Word games are generally engaged as a source of entertainment, but have been found to serve an educational purpose as well. Word games and puzzles are spoken or board games often designed to test ability with language or to explore its properties. For instance, young children can find enjoyment playing modestly competitive games such as Hangman, while naturally developing important language skills like spelling. Solving crossword puzzles, which requires familiarity with a larger vocabulary, is a pastime that mature adults have long credited with keeping their minds sharp.

Word games take many different forms. For example, letter arrangement games ask the player to form words out of a seemingly random string of letters. Examples of letter arrangement word games include Scrabble, Boggle, Upwords, and Literati.

#### Figure 2. 1 Letter arrangement games: Scrabble

Structured games are word games that focus on the semantics of words. In these games, players are asked to interpret word, picture, or action clues to <https://assignbuster.com/literature-review-on-the-research-on-games-computer-science/>

solve the puzzle. Examples of structured word games include Charades, Taboo, and Scattergories.

#### Figure 2. 2 Structured games: Taboo

Linguistic recreations offer a chance to work on building vocabulary and language skills without investing a great deal of time in a particular puzzle. Examples of this type of word game include anagrams, palindromes, and homophone word games. Paper and pencil games such as hangman, word searches, or crossword puzzles are very popular with children. However, a number of puzzles exist for adults as well.

#### Figure 2. 3 Paper and pencil games: Word Search

According to E. Moore (2007), adventure games usually combine puzzle-solving with storytelling. The structure holding the game together is an extended narrative that calls for the player to visit different locations and run into many different characters. Find out the solution to solve the various puzzles in the game is the main enjoyment for players. Puzzles usually requires player to gather items by exploring the playfield or interacting with characters. Items must be used in different ways until the correct combination gives the requisite solution.

There are three types of adventure games. Text-based adventure games are one of the earliest types of computer games. It presents a series of puzzles in story form for the player to solve. Player moves from location to location by typing commands into a parser system. A description of the new location

appears if the player enters the correct information. Examples of text-based adventure games are Gateway(1992) and Eric the Unready(1993).

#### Figure 2. 4 Text-based Adventure Games: Gateway

Graphical Adventure Games grew as there is more demand for graphics in games. Graphics became more important as the player directed the movement of the main character around the screen by mouse click. Myst (1991) was a popular graphical adventure game. The game had a first person point-of-view with few animations, no characters to interact with, and no inventory for holding items. Its gameplay was simple where players were confronted to sort out in order to find specific objects.

#### Figure 2. 5 Graphical Adventure Games: Myst

Action-adventure games are games that include elements from both action and adventure games. These games rely more on puzzle-solving to get through the story than most first-person or third-person shooters. They are similar to role-playing games but without the levelling up or experience level increases that are granted to characters over time through combat or practice. Examples of action-adventure games include Alone in the Dark (1992), Blade Runner (1997) and Indiana Jones and the Infernal Machine (1999).

#### Figure 2. 6 Action-adventure Games: Indiana Jones and the Infernal

#### Machine2. 4 Formal Elements in Games

According to Fullerton (2008), formal elements are those elements that form the structure of a game. Players, objective, procedures, rules, resources, <https://assignbuster.com/literature-review-on-the-research-on-games-computer-science/>

conflict, boundaries, and outcome: These are the essence of games, and a strong understanding of their potential interrelationships is the foundation of game design.

#### 2. 4. 1 Players

Players must willingly agree to the rules and constraints of the game in order to play. Invitation to play is the most important moment in a game. The number of players in a game needs to be considered in designing a game. The system will not function without the exact number of players. Roles of players enables player to choose a variety of roles.

Player interaction pattern is another choice to consider when designing a game. Single player versus game is a game structure in which a single player competes against a game system. Multiple individual players versus game is a game structure in which multiple players compete against a game system in the company of each other. Player versus player is a game structure in which two players directly compete. Unilateral competition is a game structure in which two or more players compete against one player.

Furthermore, multilateral competition is a game structure in which three or more players directly compete. Cooperative play is where two or more players cooperate against the game system. Team competition is a game structure in which two or more groups compete.

#### 2. 4. 2 Objectives

According to Rabin (2005), objectives give players something to strive for and it defines what players are trying to achieve within the rules of the <https://assignbuster.com/literature-review-on-the-research-on-games-computer-science/>



game. Prensky(2000) states that objectives or goals make games different from other kinds of play.

The objective in a capture game is to take or destroy something of the opponent's, while avoiding being captured or killed. The objective in a chase game is to catch or avoid an opponent. In race game, the objective is to reach a goal-physical or conceptual-before the other players. The objective in an alignment game is to arrange the game pieces in a certain spatial configuration or create conceptual between categories of pieces. The objective in a rescue or escape game is to get a defined unit or units to safety.

The objective in a forbidden act game is to get the competition to break the rules by laughing, talking, letting go, making the wrong move, or otherwise doing something they shouldn't. The objective in a construction game is to build, maintain, or manage objects. Games with a construction objective often make use of resource management or trading as a core game play element. Moreover, construction games can often be left open to player interpretation as to what ultimate success is within the game. In exploration games, the objective is to explore the game area and is always combined with a more competitive objective. The objective in a solution game is to solve a problem or puzzle before than the competition. The objective in the game of wits is to gain and use knowledge in a way that defeats the others.

#### 2. 4. 3 Procedures

Fullerton(2008) states that procedures are the methods of play and the actions that players can take to achieve the game objectives.

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### 2. 4. 3. 1 System Procedures

Digital games have multifaceted system procedures that work behind the scenes, responding to situations and player actions. If the game were to be played on paper, system procedures need to be calculated by the players, using dice to generate random numbers. If the game is played digitally, the same system procedures are calculated by the program rather than the players. Therefore, digital games can involve more sophisticated system procedures and process them more quickly than nondigital games.

### 2. 4. 3. 2 Defining Procedures

The limitations of the environment in which the game will be played need to be considered when defining the procedures of the game. Procedures are affected by physical constraints such as the type of input/output devices the setting will have and the proprietary controller the players have.

### 2. 4. 4 Rules

According to Fullerton (2008), rules describe the game objects and actions that can be made by player. Rules can be explained in the manual or can be implicit in the program itself. However, too many rules might make it difficult for the players to manage their understanding of the game. Leaving rules unstated or poorly communicating them might confuse or alienate players.

### 2. 4. 5 Resources

In game, resources are assets that can be used to accomplish certain goals. Resources must have both utility and scarcity in the game system. If resources are overly abundant, they will lose their value in the system.

#### 2. 4. 5. 1 Lives

The classic resources in action games are lives, where player have a certain number of lives to accomplish the goals of the game. If player lose their lives, they have to start over. Do well, and player will earn more lives to work with.

#### 2. 4. 5. 2 Units

In games in which the player is represented by more than one object at a time, they generally have unit resources to manage. Unit can be all of one kind or a number of different types. Units can keep the same values throughout the game, or they can upgrade or evolve.

#### 2. 4. 5. 3 Health

Using health as a resource helps to dramatize the loss or near loss of lives and units. Using a resource like health usually means that there is some way to increase health, even as it is lost as part of gameplay.

#### 2. 4. 5. 4 Currency

One of the most powerful resource types in any game is the use of currency to facilitate trade. It is one of the key-element of an in-game economy.

#### 2. 4. 5. 5 Actions

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In some games, actions, such as moves or turns, can be considered resources. Players must plan their turns carefully to not waste any potential actions.

#### 2. 4. 5. 6 Power-Ups

Power-up is a classic type of resource that gives a boost of some sort to the player. This boost can increase size, power, speed, wealth, or any number of game variables. Power-ups are also generally temporary, limited in number, available for only a short time, or useful only in certain game states.

#### 2. 4. 5. 7 Inventory

Inventories are objects that help players to accomplish game objectives, and they are made scarce by their high price at purchase or by the opportunity cost of finding them. Objects like ammunition or weapons can also be thought of as inventory.

#### 2. 4. 5. 8 Special Terrain

Special terrain is used as a resource in an important part of some game system, especially those that are map-based systems, such as strategy games.

#### 2. 4. 5. 9 Time

Some games use time as a resource by restricting player actions by time or phases of the game in periods of time. Time is an inherently dramatic force when used as a resource.

#### 2. 4. 6 Conflict

Conflict emerges from the players trying to accomplish the goals of the game within its rules and boundaries. Conflict is designed into the game by creating rules, procedures, and situations that do not allow players to accomplish their goal directly.

#### 2. 4. 7 Boundaries

Boundaries divide the game from everything that is not the game. Boundaries keep player away from their limitation.

#### 2. 4. 8 Outcome

The outcome of a game must be uncertain to hold the attention of the players. There are several ways to determine outcome, but the structure of the final outcome will always be related to both the player interaction patterns and the objective.

### 2. 5 Dramatic Elements in Games

Dramatic elements give environment to gameplay, covers and put together the formal elements of the system into a significant experience. Challenge and play are basic elements found in all games. More complicated dramatic techniques, like premise, character and story are used in many games to explain and improve the formal system in order to generate a deeper sense of connection for the players and enriching their overall experiences.

#### 2. 5. 1 Challenge

Challenges in games are tasks that are satisfying to complete and require just the right amount of work to create a sense of accomplishment and enjoyment. Challenge is very individualized and is determined by the abilities of the specific player in relationship in the game. Challenge is also dynamic where player find one task challenging at the beginning of a game but no longer find it challenging after accomplishing the task. Therefore, game must adapt to remain challenging and hold the interest of the more accomplished player.

### 2. 5. 2 Play

The potential for play is another key dramatic element that engages players emotionally in games. In games, the constraints of the rules and procedures are the rigid structure, and the play within that structure is the freedom of players to act within those rules. Play helps us learn skills and acquire knowledge, socialize, assists us in problem solving, allows us to relax and makes us see things differently. Play as a process of experimentation is an area of common ground for artists, scientists as well as children. Play is recognized as a way of achieving innovation and creativity because it helps us see things differently or achieve unexpected results.

### 2. 5. 3 Premise

Premise establishes the action of game within a setting or metaphor. Without a dramatic premise, many games would be too abstract for players to become emotionally invested in their outcome.

In traditional drama, premise is established in the exposition of a story. Exposition sets up the time and place, characters and relationships, the prevailing status quo, etc. Other important elements of story that can be addressed in the exposition are the problem, which is the event that upsets the status quo and creates the conflict; and the point of attack, which is the point at which the problem is introduced and the plot begins.

The first task of a premise is to make a game's formal system playable for the user. Rather than shooting at abstract blocks on a screen, players shoot at aliens in Space Invaders. Beyond simply concretizing abstract system concepts and making the game playable, a well thought-out premise can also create a game that appeals to players emotionally.

#### 2. 5. 4 Character

Characters are the agents through whose actions a drama is told. By identifying with a character and the outcome of their goals, the audience internalizes the story's events and empathizes with its movement toward resolution.

There are several ways to understand fictional characters in stories. First is psychological that is the character as a mirror for the audience's fears and desires. Characters can also be symbolic, standing for larger ideas such as Christianity, the American dream, democratic ideals etc. They can also be representative, standing for a segment of people, such as socioeconomic or ethnic groups, a group with a specific gender, etc. Characters can also be historic, depicting real-world figures.

Characters are defined within the story by characterization-what they say, what they do, what they look like, or what others say about them. There are four key questions to ask when writing the character's presence in the story: What does the character want? What does the character need? What does the audience/player hope? What does the audience/player fear?

Game characters have many of the same characteristics and functions as traditional characters, and they are often created using the same techniques of characterization. Game characters also have some unique considerations. The most important of these is the balance between "agency" and "empathy". Agency is the practical function of a character to serve as a representation of the player in the game. Empathy is the potential for players to develop an emotional attachment to the character, to identify with their goals and the game objectives.

## 2. 5. 5 Story

In game, the outcome of the story is uncertain. Plays, movies, television, and games are all media that involve storytelling and narratives that begin in uncertainty and that are resolved over the course of time. However, the uncertainty in a film or a play is resolved by the author, while the uncertainty of a game is resolved by the players.

In many games, story is actually limited to backstory, sort of an elaborate version of premise. The backstory gives a setting and context for the game's conflict, and it can create motivation for the characters, but its progression from one point to the next is not affected by gameplay.



There are some game designers who are interested in allowing the game action to change the structure of the story so that choices the player makes affect the eventual outcome. There are several ways of accomplishing this. Firstly, is to create a branching story line. Player choices feed into several possibilities at each juncture of a structure like this, causing predetermined changes to the story.

### 2. 5. 6 World Building

World building is the deep and complicated design of a fictional world, often beginning with maps and histories, but potentially including complete cultural studies of inhabitants, languages, governments, politics, economies, etc. The most famous fictional world, and perhaps the most complete, is J. R. R. Tolkien's Middle-earth. Tolkien began by creating languages, then the creatures who spoke them, and later the stories that took place in the world.

### 2. 5. 7 The Dramatic Arc

Conflict keeps player from accomplishing their goals too easily, but draws players into the game emotionally by creating a sense of tension as to the outcome. The conflict that the player encounters can be against another player, a number of other players, obstacles within the game system, or other forces or dilemmas.

When the conflict is set in motion, it must escalate for the drama to be effective. Escalating conflict creates tension, and in most stories, the tension in a story gets worse before it gets better, resulting in a classic dramatic arc.

## 2. 6 Reviews on Existing Word Games

### 2. 6. 1 Hangman Word Game

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Hangman is a classic paper and pencil word game. Number of players for this game is two or more players. There are two different roles of players in this game. One player is acts as an executioner and is required to think of a word or short phrase. The executioner will mark out a row of dashes, giving the number of letters for that particular word or phrase to be guessed. The rest of the players act as guessing players and tries to guess the word by suggesting letters.

The objective of this game is to guess and solve the word or phrase given by the executioner and avoid the man on the gallows from being hung. There are several procedures in this game. If the guessing player suggests a letter which occurs in the word, the executioner writes it in all its correct positions. If the suggested letter does not occur in the word, the executioner draws a body part to the gallows (head, body, left arm, right arm, left leg, right leg). The player will continue guessing letters until they can either solve the word (or phrase) or all six body parts are on the gallows.

0

Word:

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Guess:

E

Misses:

2

Word:

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Guess:

A

Misses:

e, t

1

Word:

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Guess:

T

Misses:

e

3

Word:

\_ A \_ \_ \_ A \_

Guess:

O

Misses:

e, t

4

Word:

\_ A \_ \_ \_ A \_

Guess:

I

Misses:

e, o, t

7

Word:

\_ A N \_ \_ A N

Guess:

H

Misses:

e, i, o, s, t

5

Word:

\_ A \_ \_ \_ A \_

Guess:

N

Misses:

e, i, o, t

8

Word:

H A N \_ \_ A N

Guess:

R

Misses:

e, i, o, s, t

6

Word:

\_ A N \_ \_ A N

Guess:

S

Misses:

e, i, o, t

g

Word:

H A N \_ \_ A N

Guess:

Misses:

e, i, o, r, s, t

Figure 2. 7: Example of player trying to guess the word Hangman.

There are rules to solve this word game. In descending order, the 12 most occurring letters are e-t-a-o-i-n-s-h-r-d-l-u in English Language. This and other letter-frequency lists are used by the guessing player to increase the odds when it is their turn to guess. On the other hand, the same lists can be used by the puzzle setter to stump their opponent by choosing a word which deliberately avoids common letters (e. g. rhythm) or one that contains rare letters (e. g. quartz). Another rule to solve this word game is to guess the

vowels first. In English, there are only five vowels (a, e, i, o, and u), and almost every word has at least one.

## 2. 6. 2 HangAroo Word Game Figure 2. 8 Hangman Word Game

HangAroo Word Game is a modification of the classic Hangman Word Game. It is designed to be more interactive compared to the paper and pencil word game. HangAroo is designed for only one player. Player acts as guessing player and has to guess the phrases by selecting letters from the alphabet to fill in the slots in order to complete the game. This is a single player versus game structure in which a single player competes against a game system.

The objective of HangAroo is similar to Hangman that is to guess and solve the word or phrase to complete a level. Player needs to complete ten puzzles to save a kangaroo.

The procedures of HangAroo are similar to Hangman. HangAroo contained thousands of terms and phrases and is presented in random order each time player plays. The categories of games include literature, science and technology, geography and history, movies etc. The exact boxes representing the number of letters to be guessed are shown. Player can select letters by either clicking on the letter buttons above the puzzle or using keyboard to key-in the letter. The indicator at the top left corner of the screen will show how many puzzles player have completed.

The rule of this game is player is only allowed to make four wrong guesses. If player make more than four wrong guesses, the kangaroo will be hung and

the game is over. The kangaroo will give some expressions whenever player guesses a letter.

The conflict of HangAroo is to avoid making wrong guesses to keep kangaroo from being hanged. Player has to be careful while guessing the letter to keep kangaroo alive.

## 2. 7 Reviews on Existing Adventure Games2. 7. 1 Bookworm

### AdventuresFigure 2. 9: Bookworm Adventure

Bookworm Adventures is an adventure game that combines word-forming computer puzzle game with several elements of a computer role-playing game. This game is designed for one player. In this game, the role of player is Lex the bookworm. Player interaction pattern for this game is single player versus game in which a single player competes against a game system.

The objective of Bookworm Adventures is to form words from a grid of available letters to defeat the enemies.

Player needs to follow the procedures in order to achieve the game objective. Players guide Lex the bookworm through a number of stages, battling creatures along the way. Enemies in Bookworm Adventures are damaged by forming words. After a certain number of battles are won, a “boss monster” of increased difficulty is encountered. If players defeat the boss, they complete the stage and are rewarded with a treasure item.

Treasures provide special abilities to Lex, such as a reduction in damage caused to him, or more damage generated from words containing certain

letters. In some cases, rather than receiving a new item, an existing item is  
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upgraded. After the player has accumulated more than three items, player must choose which three items to bring along on later chapters.

The rule of this game is to form longer word from a grid of available letters. The longer the word which is formed, the more damage is done to opponents. Similarly, words generated using letters which are less common do more damage than those using only common letters. Each turn, players can form a single word, while enemies use one of their available attacks to injure Lex, heal themselves, or otherwise make the battle more difficult. Lex automatically recovers all of his health between battles if it wins.

The resource of this game is health. Both Lex and his enemies have health meters. Their health levels are represented by a number of hearts. The number of hearts will be reduced when either party is defeated.

In Bookworm Adventures, forming longer word from a grid of available letters is the conflict of the game. Player needs to have good vocabulary to form long word. Long word is required to give more damage to enemies.

2. 7. 2 Big City Adventure New YorkFigure 2. 10 Big City Adventure New York

Big City Adventure New York is an adventure game where a family gets to travel within New York. There are 90 rounds in this game to complete. This game is designed for one player. Player can choose to play different roles such as Mom, Dad, Grandpa, Grandma, Sister and Brother. Single player versus game is the player interaction patterns in this game where single player competes against a game system.

The objective of this game is to search hidden objects through wonderful locations like Central Park, Wall Street and Time Square. Player gets to explore and discover the fascinating facts about New York and its history by travelling to the next destination after completing each round.

There are procedures in order to complete each round. Player needs to find and click on all the objects hidden in the picture. Player that manages to find the objects quickly will earn a Quick Find Bonus. Between rounds, there are exciting mini-games like Mahjong and Match 3 boards for player to complete. Player will receive a memento for each location when they complete the round. Collect all 60 mementos to complete the Big City Adventure.

Player can look for the hidden Bonus Coins in the picture and use them whenever they need some help. Player will receive bonus points at the end of the round if those coins are save for later. Furthermore, player will be given hints if they have trouble locating the hidden object. Each Hint Coin will help player to locate one hidden object.

The rule of this game is to search all the hidden objects in the picture within the time limit. Clicking on too many incorrect items while searching the hidden objects will result 30 second of penalty. Player needs to be observant and focus while searching for the hidden objects.

In Big City Adventure New York, the resource of the game is time. Time is being restricted for the player throughout the process of finding hidden objects. However, player can choose the relax mode to play this game without time limit.

The conflict of this game is player might not be able to find all the hidden objects in the pictures. Some objects are too small or hidden in an unobvious place and is difficult for player to find it. Player might run out of hints when they are unable to locate the objects.

## 2. 8 Conclusion

In conclusion, this chapter gives the definition of game, description of game genres, explains the formal and dramatic elements in games and review the existing word game and adventure game. It is important to understand all these elements in order to design and develop a game. The ideas from the existing games are being used and combined to further design and develop the Traveler's Word game.