# Designing for Children
## - With focus on 'Play + Learn'

## Designing Games for Children

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**Abstract**: Learning and fun are integral to play. A player acquires knowledge or qualities through play from the themes of the game as well as the nature of play. Fun is critically essential for games. Both these are linked to the age group of the players. The parameters which impart knowledge through play can be controlled and designed to suit the age of players. Chance, skill and strategy are important factors which deliver fun to players. The mix of these decides the suitability of a game to the targeted age group. Analyzing games with respect to these factors enables the designer to maximize fun.

*Key words: Learning, fun, social skills, age, chance, skill, strategy, mental skills, modifying games.*

Games impart fun and knowledge during play. Among the vast variety of games, the concepts presented here can find applications as well as contradictions in board games, outdoor games, video games, imaginative play and professional games.

### 1. Learning during play
Every game involves a learning process.

In this context we have to note that the meaning of 'learning' is not limited to the formal education alone. It also includes acquiring several qualities which are not part of the normal education curriculum.

In games which are theme based, certain basic knowledge relating to the theme is instilled in the player in the process of playing.

MONOPOLY game introduces the player to handling currency and in the latest versions- even plastic money. Aspects of buying, selling, mortgaging and rent are also introduced to the players. Apart from these features of any MONOPOLY game, the locations on the game board become familiar places to the players.

Word construction games, like SCRABBLE and UPWARDS challenge the player into increasing their vocabulary.

Even simple games like SNAKES & LADDERS can help the player in the basic process of counting and structured movement.

While the games cited above offer knowledge based on the themes and the playing process, there are other learning process happening in the background during 'play'. Team work, social skills, logical reasoning, strategy development, intense concentration, faster reflexes and visualization are a few of the qualities that are developed in players during the game play.

The extent to which many of these qualities can be included in a game is a conscious decision by the game designer. This decision is based on the suitability of the theme, to include any of the qualities and also the fact that the complexity of the game should not be a deterrent to playing it. But primarily the decision is dependent on the age of the targeted players.

In the game Snakes & Ladders, if two dice are used for play, this increases the complexity of the game for the player of lower age, as addition of two numbers is now an element in play. In the same game if there were four players as two teams and only one dice, then each player of a team could throw once and move the pawn of the team separately. This avoids addition of numbers and at the same time induces team play into the game. It is the age of the players that is the main deciding factor in choosing the several alternatives to a game.

## 2. Fun and play
Peeping into the core of  a game, we find that the unexpected challenges thrown up by the game play (the system) and the process of trying to overcome, these challenges, by certain actions within the structure of the game (rules), is what imparts fun.

A very clear understanding of what the challenges are that are thrown up during the game play, how these have to be overcome and, what are the resources that the players need – these are important issues to be decided. Answers to these issues hold the key to imparting fun during game play. It is important to consider the non tangible resources of the player, as vocabulary in a game of Scrabble or general knowledge in Trivial Pursuit.

Again age of the player is the fundamental criteria in determining the nature and extent of the challenges and the process of overcoming them. The fun and the learning aspect of any game can be imparted effectively only when the game has been specifically designed and is suitable for the targeted age group.

The targeted age group of the players is most of the time a commercial decision. A designer starts off with the core game play, age group and the theme, to develop a game. Armed with these 'blinkers' the designer needs to make decisions which enables playing the game a fun-filled exercise which imparts certain knowledge or qualities to the players.

There are three important and basic factors, which determine the suitability of a game for any particular age group. They are CHANCE, SKILL and STRATEGY (CSS).

Chance is that randomness which is deliberately built into the game by the game designer. It could be by way of a throw of the dice, turning the spinner or by the blind picking of a card from a stack. It is important to differentiate this randomness, from that of the variations of the decisions of a player in the game. A player can face randomness in the play due to the choice of decision of the opponent, which is unknown. This situation is an occurrence of strategy (or maybe even lack of it). Chance is a factor which can the turn the direction of the game in ways which none of the players can be sure of.

Skill is the dexterity acquired by repeated playing of the game. This mostly relates to the physical aspects of the playing process and is an integral element in all action games.

There also are the mental skills, which are employed more in board games than physical skills. Vocabulary is a mental skill that a player develops the more he or she plays word building games. This enables the player to have wider options in forming words with available letters. The ability to form words using the vocabulary, which maximize one's score, to build

upon the words formed by the opponent and to block the opponent from forming high scoring words, is all part of strategy which is distinctly different from the skill of forming words alone. Same is the case with memory or visualization.

Such mental skills which enable the player to form decisions in the play which help to improve the performance and / or to retard the opponent, is Strategy. Strategy is employed by the player to put the resources available to maximum use. This always is a mental thought process while the manifestation would be physical as in the placement of a pawn in chess or dodging in a game of tag. A player's ability to come up with alternate strategies increase with repeated play. This creates a grey area between skill and strategy in some cases. All the same this faculty is a very important factor linking age and the game play.

All games have these three factors in various proportions, contained within it. The correct mix of chance, skill and strategy in different proportion determines the suitability of the game for the targeted age group.

3. GAME ANALYSIS:
With reference to the definitions of chance, skill and strategy outlined above, analysis of a few popular games can help to understand the content of each in them,

Consider the game Snakes & Ladders. This is a game which caters to a low age group, typically 4 to 6 years old. The game has been in existence for several decades and also several theme based adaptation of this game have been done like DORA or DISNEY.
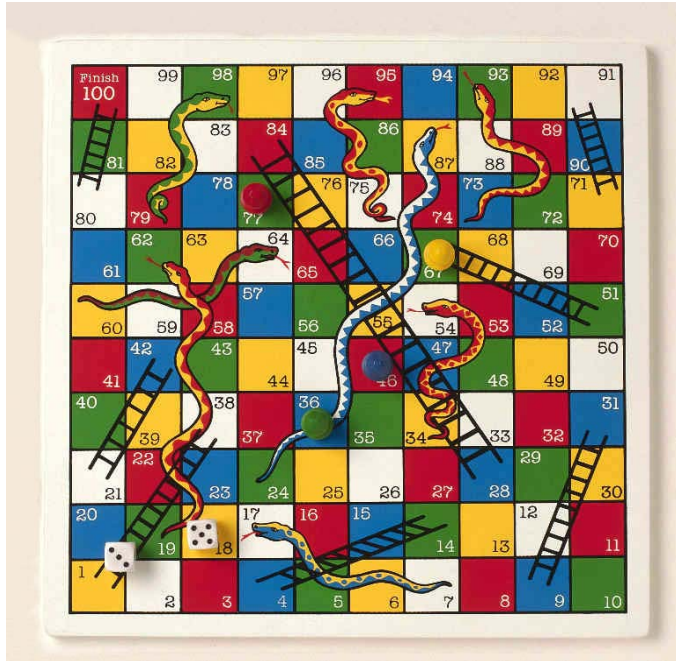
Figure. 1

What are the proportions of Chance, Skill and Strategy in this game? Chance is the only element in this. There is no strategy that can help you to be the winner (unless you load the dice, which is not in the frame work of the game play or rules). There is no specific skill that a player can acquire or develop to win the game. Hence we can say that this is a 100% chance game.

Take another popular game Loopin Louie. Here the predominant element is skill. As a player plays more, he or she gains more skill in bouncing Louie during the rotation and thereby becoming the winner. This is a game for the age group 4 and above. This can be said to be skill based game. There is no chance 'programmed' into the game, nor is there any strategy that can be employed to win the game.

Figure. 2

Consider Chess. There is no chance in this game. Nor are there any skills that can help one win the game. One might tend to say that the luring the opposing player into wrong moves is a skill. But in this analytical context, this is a strategy which is employed, rather than a skill. It also is not a skill as repetitions of the same action does not increase one's probability of winning the game. Hence Chess is a 100% strategy game. This game caters to higher age group starting from 10 upwards.



Figure. 3

## 4. CSS Grid

The elements CSS can be pictorially represented at the vertices of a triangle as below. (Figure. 4)
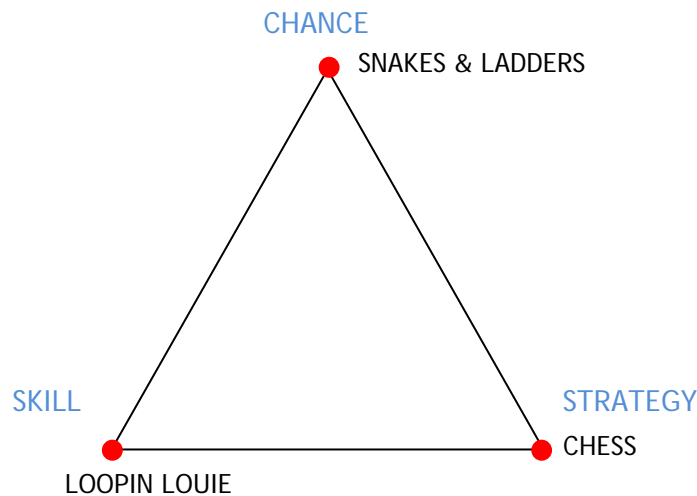


Figure. 4

Any game can be positioned within this triangle, based on the mix of chance, skill and strategy in it. Hence the three games Snakes and Ladders, Loopin Louie and Chess would fall at the vertices chance, skill and strategy, respectively. (Figure. 4)

Though these three games have a full measure of chance, skill or strategy in each, many of the current games are a mix of any two or three of the factors. Board games having all three are fewer.

Analyzing the other games mentioned earlier, Monopoly has chance brought in by the throw of the dice. There are several strategic decisions to be taken during the game regarding buying, developing, mortgaging and selling properties. Within the triangle, Monopoly can be placed between Chance and Strategy. A deeper analysis of the game reveals that the game is driven more by chance than strategy. Skill is not a factor in the game.

Scrabble has chance in it, in the blind draw of letter tiles. Skill is evident as a mental faculty which is acquired by more play i.e. development of vocabulary. The placement of the letters

on the board involves strategic thinking to maximize earned points without giving opportunity to the opponent.



Figure. 5

Analyzing a game and positioning it in the triangular grid, helps us to

1. Get an insight into how to make the game relevant to the age group the game is intended for.
2. Develop adaptations of a basic game to suit a different age group, and
3. Carry out a cohesive blend of the various elements of the game – the software as well as the hardware.

For lower age groups a very high content of chance is preferred. As the age goes up the content of skill and strategy can be increased. Purely skill based or strategy based games are suited for only higher ages typically 10+.

Given a game that has been test played with the targeted age group, and if the designer finds it not meeting the intended levels of enjoyment, the content of CSS in may be analyzed. This can give an indication how the game needs to be tweaked to make it better suited.

Munching Moos is a game which was initially configured as a 4 player game and targeted at an age group 3 plus. Each player had a cow and a field for the cow to graze. The player whose cow finished grazing its field first, won. A spinner decided the action of the cow either to graze on the patches of grass or go the watering hole or just go to sleep. The game at this stage was purely chance based. This (Munching Moos-1) is positioned at the apex of the CSS grid (Figure. 8). As it was later decided to increase the targeted age to 5 plus, an element of strategy had to be included. Keeping strategy low in content, it was decided to add the feature of grass growing back in the spinner. This feature now enabled a player who got this option, to 're-grass' an eaten patch in the adjacent players field. This (Munching Moos- 2) was seen to increase the excitement and fun of the game substantially.



Figure. 6

There are several instances, where a game has been adapted to suit a lower age group while retaining the core game play. An example is the basic game of **Monopoly** and the variant - **Monopoly Junior** (Figure. 7).

While the original Monopoly has been tagged for ages 8 upwards, the Junior version is 5 to 8. The original game has chance at every move and strategy in the decisions to buy, mortgage, develop or sell properties. The junior version has the theme of a carnival park with several rides and games. It does away with the decisions of buying and selling. Any player landing on a property pays the bank puts up a ticket booth on it. Developing a property by building houses and hotels is not there. As compared to the original game where there are totally 6 chance spaces, in the Junior version there are 10. The positions of both versions are marked in the CSS grid (Figure. 8).



MONOPOLY



MONOPLOY JUNIOR

Figure. 7

There also are games where two difficulty levels are included in the instructions. If these variants are not carefully analyzed and developed there could be a danger of ending up with just prolonging the game rather than varying the challenge levels.

CHANCE

MUNCHING MOOS - 1
MUNCHING MOOS - 2
MONOPOLY JUNIOR

TRIVIAL PURSUIT

SCRABBLE
UPWORDS

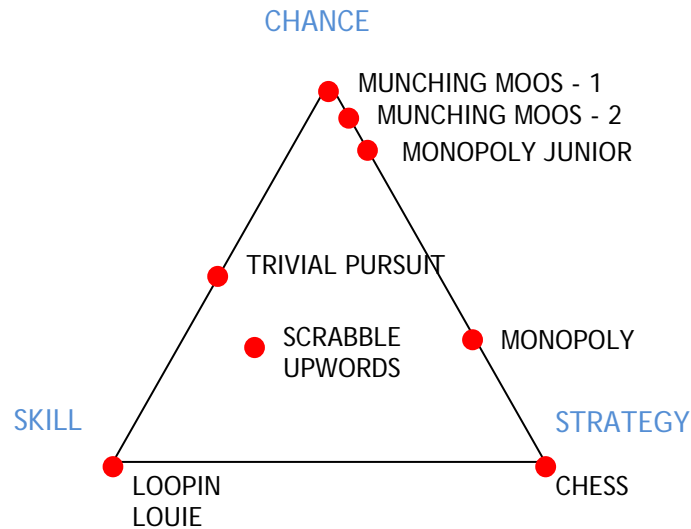MONOPOLY

SKILL

STRATEGY

LOOPIN
LOUIE

CHESS

Figure. 8

The enjoyment derived from a game is not just limited to the game play, but also from the various components of the game. Setting up the game board, the graphics and the various components of the game play have great importance in making the game a fun filled experience.

The CSS grid is intended to give the designer a perspective as to where the game stands with respect to the intended players. It also gives a reference point from which to develop variants for different ages and suit different themes.

While this grid serves as a very general format, there exists scope in finding a method to establish the actual content of CSS of any game, in terms of a measurable value, so that the adjustments are finer and better controlled. Also a precise and better understanding of the correlation between CSS and various ages would be of great help in the initial stages of game designing.

**Acknowledgement**