

Time Hunger

CS 798 Game Design Document

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Introduction

Can board game help the players improve their time management skills? Also, in terms of game design, how can a board game highlight the practice of a specific skill properly so that players could play it multiple times and continuously polish that skill? To be specific, could first-year college students improve their time management skills by playing a board game? Time hunger is a board game designed for these purposes.

Background

Starting from several years ago, increase in psychological stress has been reported nationwide regards to college student's health. Stressors affecting students come from various aspects and are often categorized as academic, financial, time or health related, and self-imposed. Academic stressors include the student's perception of insufficient time to study and the extensive knowledge base required. Academic stress often appears predictably that the greatest sources of academic stress usually come from preparing exams, grade competition, and the large amount of content to study in a small amount of time [1]. Physical and psychological impairment presents when stress is perceived negatively or becomes excessive.

Especially, for freshmen, it may be the first time for them to have a control of their daily activities. In the meanwhile, there are suddenly increased workloads in school with sometimes not mandatory class attendance, clubs' activities, and some free time that require students to manage well at one time. How can we manage to accomplish all the tasks and achieve both academic and personal goals in limited time? We are hungry for time!

Methods to reduce stress for students often include tutoring time management skills, providing psychological support and monitoring. For this board game particular, we design it in use of training time management skills. Time is a limited source for us that it would never go back. Time management is defined as clusters of behavior that can facilitate productivity and alleviate stress [2]. This skill is important, as discussed before, in the management of study/course load. Good time management behavior can help student overcome challenges by arranging things in a good order.

Time management skills include managing activities such as prioritizing work, test preparation, and following schedules. Effective time management strategies increase academic performance [3] and are frequently recommended by academic advisors as aids to enhance achievement for college students. In other studies [4][5], productive study methods are often associated with "time management" that results in positive academic performance. Students who ignored those advised techniques such as starting large tasks

well before due dates; breaking down large tasks into small ones, and doing small tasks on a regular schedule; find themselves in great distress before exams [6].

According to [1], effective time management lowers such academic stress. Hence, it is important to have seminars in which college students can be made aware of the importance of time management in a regular base to improve academic success of students. However, this is not well advertised and utilized. Current practices may not be sufficient to raise enough attentions to both faculty and students.

It's often "costly" to practice time management skills in real life: missing achievements or ruining relationships. Sharpen those skills in health games are practical and cost effective. Here, we propose a board game letting the students to actually practice their time management skills in a simulated environment.

Game Concept

Time hunger is a board game designed to help students practice their time management skills and in turn reduce their pressure and anxiety when they need to do loads of work in a given time.

Players can choose time duration from a one-week up to a one-term journey. During the journey, the players would face events that are definitely going to happen, like classes and exams, and events that unexpectedly to happen, like dating. The players would then spend time to complete mission(s) required by the event to gain reward points. Intuitively, the more time spent on a mission, the higher reward player will get; but the reward for other missions during the same time period will be impacted. The goal of the game is to find an optimal solution to complete all the missions and maximize the reward points.

Game Mechanics:

The game is a board game and the idea is inspired by the famous game "Monopoly". Such board game can utilize the travel board and additional cards representing characters and events to add the joy of playing. Also, playing board games involves important social skills, such as communicating, sharing, being patient, taking turns, and enjoying interaction with others. Thus, the game is a multiplayer game as activities in school often involving communication with others.

The number of players of the game is from 1 to 4. We expect communication and discussion during the game. The game is designed to attract first-year university students or students who need to improve their time management skills to play.

Game Story: Player(s) are given a *1-week/1-month/1-term* journey to choose under a university-life scenario. During this journey, they will encounter daily challenges as normal college student does. They would have plenty of missions to achieve and need to manage their schedule well to achieve overall success.

Characters: Before the game starts, each player would choose one character listed below to be his/her hero/heroine. Each character represents a level of difficulty. The character

with the most working efficiency, named Sheldon, is corresponding to the *easy mode*. While the character with the second most efficiency, named Howard, is *moderate mode* and the least one, named Penny, is *hard mode*. There are also indicators to label working efficiency for each task.

Also, for different characters, they would have 3 levels of working efficiency status: Regular, High and Low. The working efficiency for the 3 levels is different as listed in Figure 1. This reflects that everyone would have status change between different tasks. When players decide to do a task, they would roll a dice to decide if the task is finished as scheduled considering their efficiency on that task.

For example, if Player Sheldon is having an assignment, which requires an average of 4.5 hours to complete, he/she needs to roll a dice when he/she reaches the scheduled start time of doing that assignment. Assuming the dice number is 6, which corresponding to High efficiency mode, then Sheldon would only need 3 hours to complete that job and the rest 1.5 hours scheduled for this task could be used for other purposes.

Working efficiency is not applicable to **deterministic events** and **certain random events**. Various working efficiency is only applicable to the events that have been indicated on the event cards.



Figure 1: Character Cards, Character's Indicators and Working Efficiency Indicators

Events: During the journey, the players would face many events that might give the players different tasks, which would cost a certain time and have different impacts on the player's overall performance. There are two kinds of events in general: deterministic events and random events.

Deterministic events:

The deterministic events are the events that have already been written on board with their pre-determined time: classes, meals and exams. Usually, as the time of those events are fixed, if the players want to arrange other events into these time slots, these events would be simply omitted. Scoring scheme for deterministic events would reflect the number of those omitted deterministic events.

Random events:

Random events are events that “pop out” and the game simulates these events by having players drawing from a shuffled deck. On the **sample board (see Figure 4)**, “Red time” denotes random events that happen with probability $2/3$ and “Blue time” denotes random events would happen with probability $1/3$. Dice rolling decides whether the random event will happen. (When the points are 1, 3, 4 and 6, random events would happen on “Red time” while the points are 2 and 5, random events happen on “Blue time”.)

Random events have two types, **certain random events** and **uncertain random events**. The following are samples of the two different random events:



Figure 2: Random Events Cards and Indicator of a Random Event

A random event, whether a certain one or uncertain one, contains 4 parts and one indicator (Figure 2):

- Indicator for tasks:
Every task has a corresponding indicator and the indicator is placed on the board to show that these time slots have already been scheduled. The length of the indicator is proportional to time length of the event.

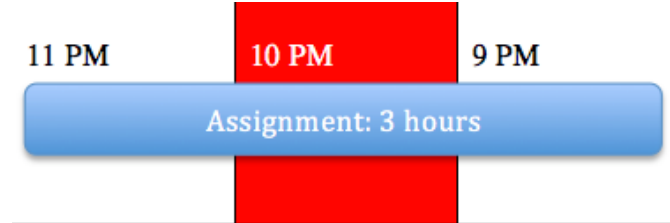


Figure 3: Placing indicators on board

- **Description for tasks:**
For example: Interview, Party, Assignment and Project Discussion. Some descriptions may involve other players like Project Discussion. At this time, players need to discuss with each other to settle a time that works for all of them.
- **Time of the event / Duration of the event with deadline:**
For the certain random events, a specific time slot is given while for the uncertain ones only the event duration is given. The players could assign the uncertain events to any available time slot before its deadline.
- **Preparation time of the event:**
For every event, there will be a preparation time. Some of them would be 0 if the event does not need a preparation time, e.g. doing assignments.
- **Priority of the event:**
The priority of the event describes the importance of that event. The larger the number is, the higher priority level the event reaches. The range of the priority level is from 1 – 5. When there are time conflicts between two events, the priority is a key factor for the players to decide which event to choose. Priority is also related to the rewarding system.

Start and End: The journey would be on a board like a calendar. Players would start the game by placing their *characters indicators* on the top-left block. The final block would be the latest time on board. On the **sample board**, when the players reach Nov. 30 at 12AM, the game would come to an end.

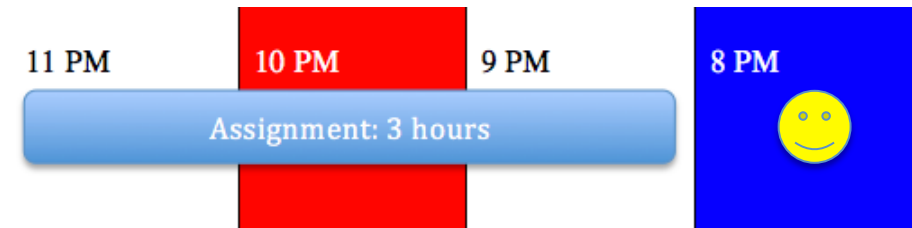
Player's action: The players would simply travel through the board according to the schedule. Every player would take turns to move forward their character indicators based on events, which has several rules:

- When the next block is blue or red, the players would need to draw a card from the random event deck according to the dice number; Once a player gets a new random event as listed on the drawn card, he/she will have the chance to rearrange his following schedule and move forward one block afterwards.

Nov. 27 9 AM 	10 AM CLASS	11 AM CLASS	12 PM LUNCH	1 PM	2 PM	3 PM CLASS	4 PM
12 AM	11 PM	10 PM	9 PM	8 PM	7 PM DINNER	6 PM BSKETBALL MATCH	5PM
Nov. 28 9 AM	10 AM	11 AM	12 PM LUNCH	1 PM	2 PM	3 PM	4 PM
12 AM	11 PM	10 PM CLASS	9 PM CLASS	8 PM CLASS	7 PM DINNER	6 PM	5PM
Nov. 29 9 AM CLASS	10 AM CLASS	11 AM	12 PM LUNCH	1 PM CLASS	2 PM CLASS	3 PM	4 PM
12 AM	11 PM	10 PM	9 PM	8 PM	7 PM DINNER	6 PM	5PM
Nov. 30 9 AM	10 AM	11 AM	12 PM LUNCH	1 PM EXAM	2 PM EXAM	3 PM	4 PM
12 AM	11 PM	10 PM	9 PM	8 PM	7 PM DINNER	6 PM	5PM

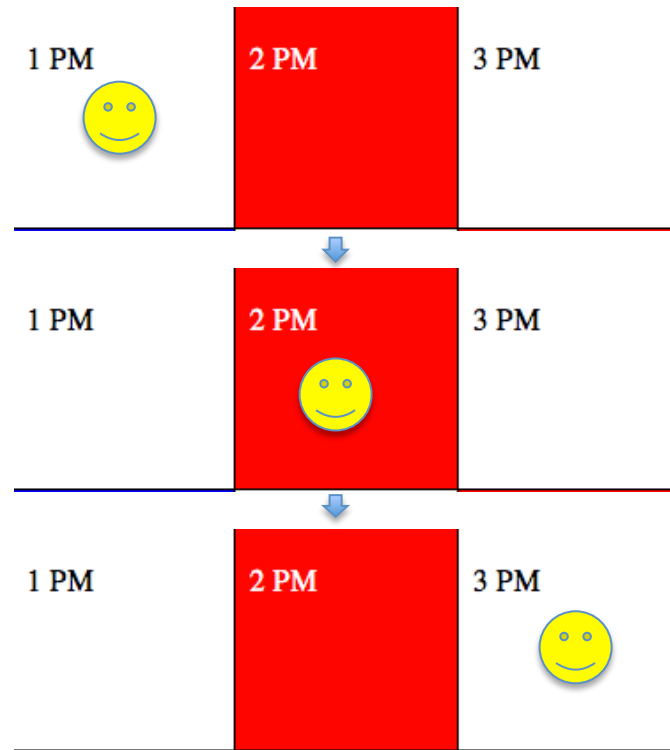
Figure 4: Sample Board: Blue Blocks (Random Events Appears with 1/3: Dice Point 2, 5); Red Blocks (Random Events Appears: Dice Point 1, 3, 4, 6)

- When the next block is the start of an event, the players need to go through the event according to their working efficiency. All the colored blocks overlapped will be omitted.



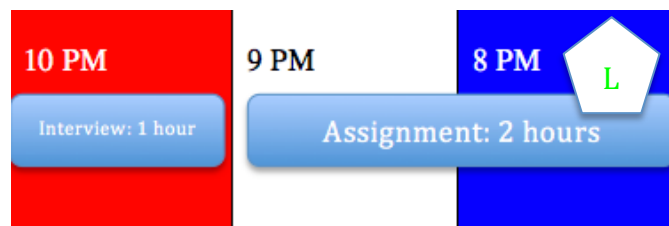
Player's Indicator's Move: New random events would not appear as usual on 10 PM; player's indicator would move directly from 8 PM to 11 PM with a 100% working efficiency

- When the next block is not the start of an event, after rearranging, he/she would move one block further.

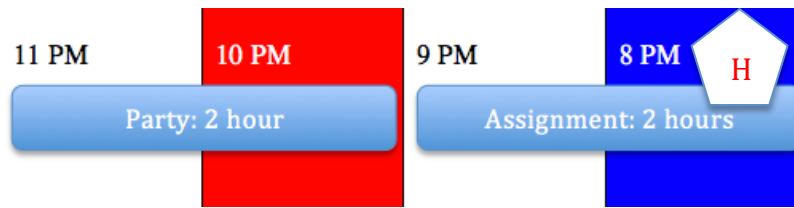


Player's Indicator's Move: When player is on 1 PM, as the next block is red, he/she would move forward to 2 PM after dice rolling and random events rearranging; then, when player is on 2PM, he/she would move to 3 PM

- If two tasks are following one to the other, there is one case that the first task is not finished on time (working efficiency in Low status). The players would have 2 choices: first, reschedule the following tasks; second, start the next task as scheduled and leave the first task with a not 100% completeness. Also, in the case of working efficiency in High status, the player can choose to reschedule the following task once finishing the first task ahead of time.



Low Status (Moderate Mode: working efficiency 80%): it would take 2.5 hours to finish the assignment. The player has 2 options: first, stop doing the homework and leave it with 80% completeness and start the interview immediately; second, try to postpone the interview time (impossible here according to the certain random event definition)



High Status (Moderate Mode: working efficiency 120%): it would only take 1.6 hours to finish the assignment, and the player can rearrange his following schedule, such as, having the party early.

Rewarding Scheme: Rewarding scheme for random events is a weighted score balancing both the priority level and completeness of that event. Each player would be asked to calculate the score on both daily and weekly bases. The event score calculation is based on the equation listed as below:

$$\text{Score}_{\text{random event}} = \text{Priority} \times \text{Min}(N_{\text{hours}} \times \text{WorkingEfficiency} / \text{TotalHourNeed}, 1)$$

Besides, if the event were not finished before the deadline, the final Score for that event would be the one calculated using the equation with a 50% weight factor. This is designed to show the negative effect of not finishing tasks on time. (Please always remember to finish missions ahead of time.)

Rewarding scheme for deterministic events, such as classes and exams, is designed differently. The score of the exams is based on the percentage of classes attended and the amount of time prepared before the exams. We assume that 10 hours preparation is enough for an optimal performance on an exam. (Characters' working efficiency also applies here.) The equation for calculating score of exam would be:

$$\text{Score}_{\text{deterministic}} = \frac{N_{\text{attended}}}{N_{\text{overall classes}}} \times 5 + \text{Min}(N_{\text{hours}} * \text{WorkingEfficiency} / 10, 1) * 10$$

Deterministic events - meals, have no reward. But if regular mealtime is interrupted, an indicator **L** will be placed on the character showing that the character is forced to be in a Low status working efficiency. (This is designed to show the importance of having meals regularly.)

Win and Lose: the winner of the game is not the one with the highest score. Their scores are only used to compare with the goals they preset for themselves. Before the start of the game, each player would choose a level of success. The game has 3 levels of success: A, B and C. If a player would like to succeed as level A, he need to get at least a score of 90 points during the journey, while level B success corresponding to at least 75 points and level C success corresponding to at least 60 points.

Highlights: By far, there is no board game focusing on improving students' time management skills in order to help them feel at ease in dealing with heavy workload.

Also, through playing this game, players could find out which mission they prefer to put the most effort in and which mission they could simply omit in a “stressful” circumstance.

Game Mechanism Testing and Game Influence Testing:

Right now, it is the first version of the game, and it definitely has some shortcomings. We would try to improve the balance of the game by continuous simulating and adopting advices from the players.

Also, to prove the effectiveness of the game, we would like to use controlled experiments to investigate the relationship between the game and academic anxiety. We would invite 300 new undergraduate students to take part into our research. 1/3 of them would start their university life as usually, 1/3 of them would take a course introducing the importance between time management and academic anxiety and the rest 1/3 would be advised to play the game regularly when taking the course (Their game result would be recorded for further study). The group would be divided equally by the result of time management questionnaires on their first day of university. Then after one month, two month, three month and one term, we would like to know their status by using two self-report questionnaires.

Academic Stress: Gadzella's Student-life Stress Inventory (SLSI) (1991) is designed to assess the students' perceived academic stress and reactions to stress. There are 51 items arranged on a Likert response format (1=never true to 5=always true) that assessed five categories of academic stressors (frustrations, conflicts, pressures, changes, and self-imposed), and four categories describing reactions to stressors (physiological, emotional, behavioral, and cognitive). Validity and reliability of the instrument have been reported earlier [7][8]. The items were summed for each subsection to get a total score in all nine categories. A higher score was indicative to greater stress and reactions to stress. Internal consistency estimates ranged from 0.69 to 0.82 on the nine categories in the present study.

Time Management: Macan et al. (1990) proposed Time Management Behaviors (TMB) scale to assess students' time management behaviors. The instrument contained 46 items with a range of "Seldom True" (1) to "Very Often True" (5). Four subscales of time management were examined: Perceived Control of Time (belief that one can affect how time is spent), Setting Goals and Priorities (goal setting and prioritizing of objectives to reach the goal), Mechanics of Time Management (planning and scheduling), and Preference of Organization (organizational approach to a project or workspace). Certain items were reverse scored so that a higher score indicated greater time management skills. Chronbach's alphas for each of the TMB factors and overall TMB score were as follows: Mechanics of time management (0.85), setting goals and priorities (0.84), perceived control of time (0.67), preference of organization (0.80), and overall TMB score (0.74). The alpha coefficients for this study of mechanics of time management, preference of organization, and overall TMB score were higher than those reported by [9].

Based on the two questionnaires, we would like to find that: (1) The controlled group would have no obvious improve on time management skills, while the group only have the courses better, and the group that played the game would have the best time

management behaviors. (2) The academic anxiety and pressure for the controlled group is the most severe; the group with only course lighter; and the game played group have the least anxiety average.

Those expected results would show a clear interrelationship between time management and academic pressure. It also proves that our game did help students with their time management skills.

Related with U-Profile:

The game could be transformed to a digital version. Also, more materials can be added to fulfill the game characters by combining with U-Profile and utilize more information provided by U-profile. Also, in digital version of the game, instead of talking to each other to settle time for a group task, we can discuss online or sending request of time preference. This could make the game be played at any time online and offline.

Reference:

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