Verbovskyy Danylo
*Master student, LNU*
Schoenberg William
*PhD, UiB*

# STUDENT LIFE SIMULATION

"Student Life Simulation" is a game for schoolchildren developed by UiB Master's students Verbovskyy Danylo and Mykhailo Marusiak in the course GEOSD-309 under the supervision of Dr. William Schoenberg and subsequently improved by the first. The game simulates student life, which most of the pupils will face in the near future and aimed at developing the following skills: structural knowledge, critical thinking, effective time management, focus and self-control (consequences of procrastination), basic financial control, basic health care. The target audience of the game is students aged 11-15. Within the field of system dynamics, the game consists of a model and a complex interface.

**Model.** The model built is shown on the Fig. 1. It consists of *Time Sector, Health Sector, Energy and Motivation Sector, Success Sector* and *Money Sector.*

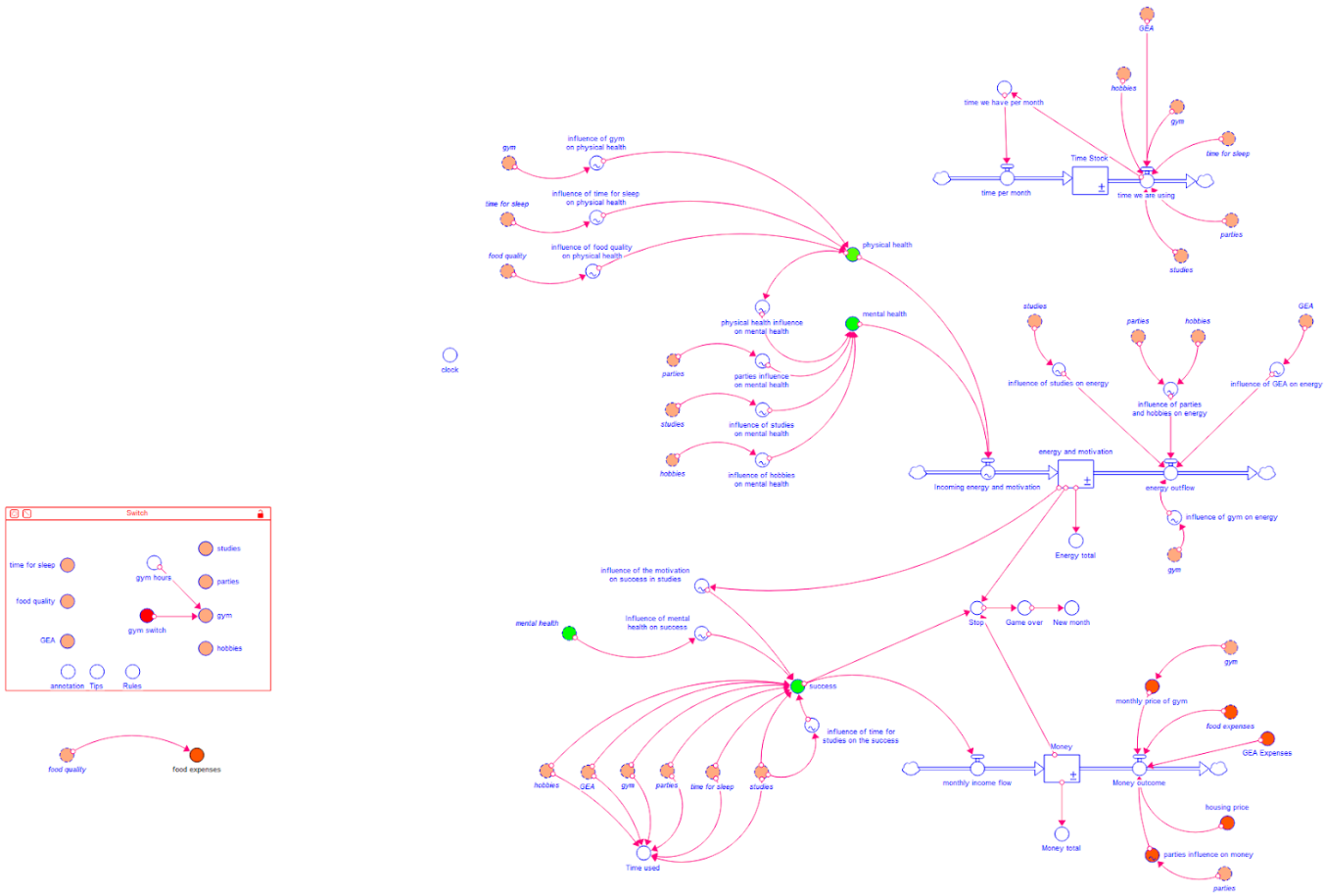


***Figure 1. System Dynamic Model***

**Time Sector.** Every month we have a constant inflow of 720 hours. Outflow reflects the time spent, consisting of 6 types of activities. Those are *GEA* (time spent for general everyday affairs – morning/evening wash, eating, moving between objects of time spending, etc.), *Sleep* (time spent sleeping), *Studies* (the amount of time student spent on classes and homework), *Hobbies* (time spent with friends, going to the cinema, reading books and playing video games, playing the guitar and skating, etc.), *Parties* (time spent partying, attending social events), *Gym* (time spent exercising). We posit that the *GEA* time cannot be changed, so it is a constant value - 100 hours/month.

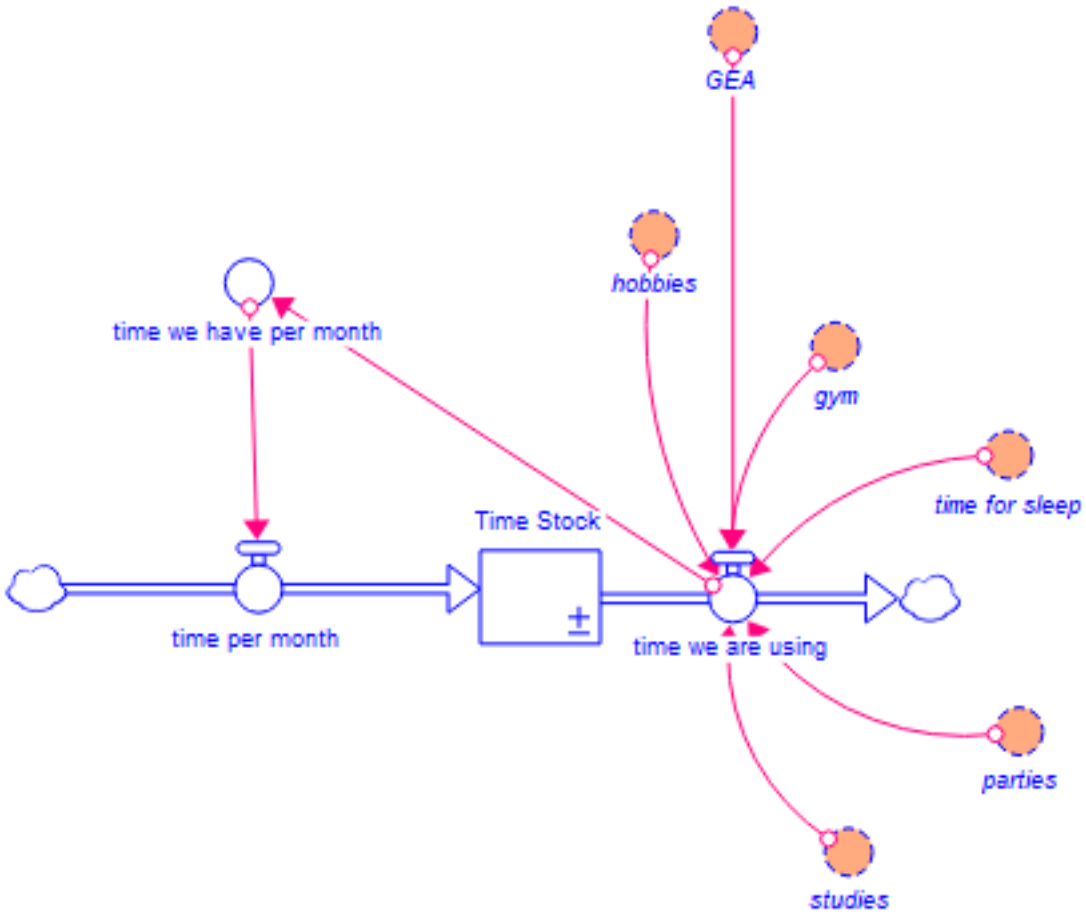


***Figure 2. Time Sector***

**Health Sector.** The player chooses how many hours to devote to each type of activity. The number of hours selected by the student correspond to certain values presented in graphic data in *influence of..* converters. *Sleep* and *Gym* directly affect *physical health*, and indirectly affect *mental health*. Also, the player has the power to choose the *food quality*, this point also affects *mental health* indirectly, through *physical health*. The 3 remaining types – *parties*, *studies*, *hobbies* directly affect *mental health*.

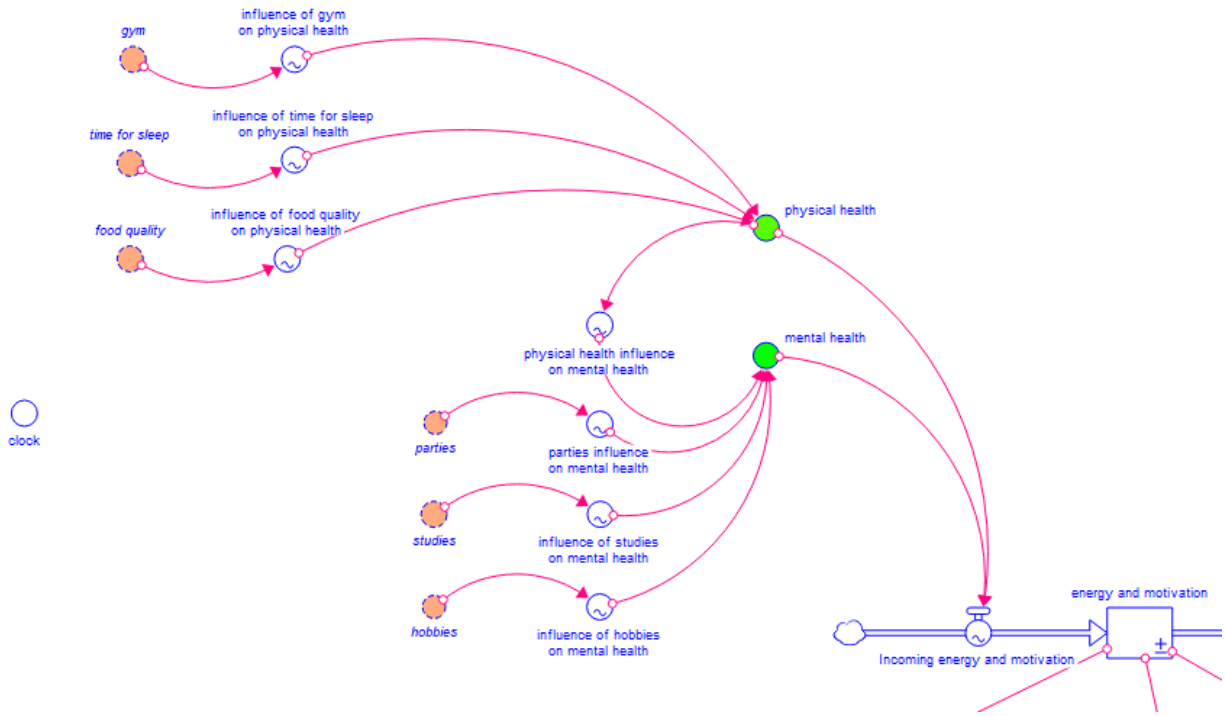


***Figure 3. Health Sector***

**Energy and Motivation Sector.** The values of physical and mental health determine how much energy and motivation you will have this month, it is represented by *energy and motivation stock*. Outflow, in turn, is affected by *studies*, *parties*, *hobbies*, *gym* and *GEA*. The number of hours selected by the student correspond to certain values presented in graphic data in *influence of..* converters. Here, the player faces the first challenge – he is tested to see if he has wisely distributed the available time within the limits of health. For example, it will not be possible to save many hours on sleep, since due to its lack energy and motivation flow will not be replenished, due to the relatively high outflow caused by other activities. If the outflow is greater than the inflow, and the stock is emptied – your plan didn't work, Game Over.

**Success Sector.** The second function of the *energy and motivation stock* is the influence on *success*. If the time is not optimally allocated to all 5 types of activities, the student will not be able to achieve a satisfactory result in studies and will lose the scholarship, and therefore the funds for living. Without this money, he will not be able to provide for himself. Game Over. This is the second challenge.

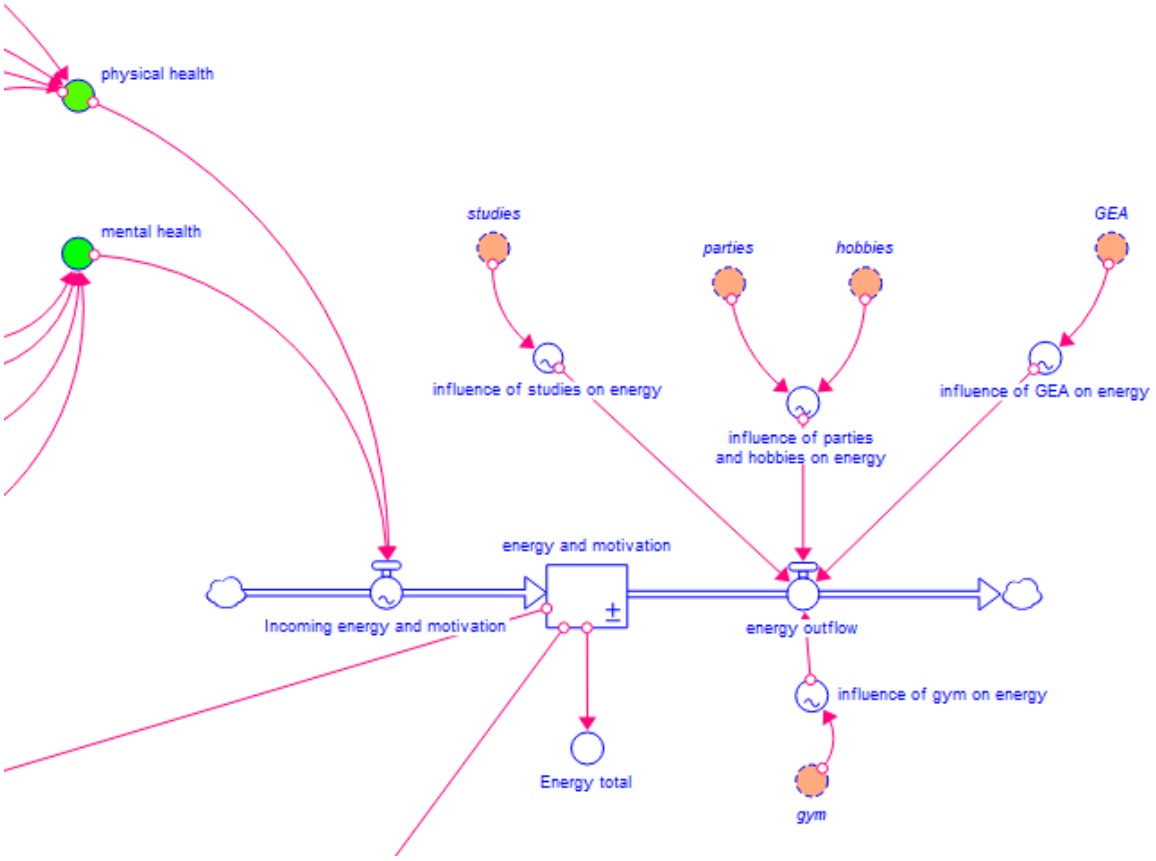


*Figure 4. Energy and Motivation Sector*

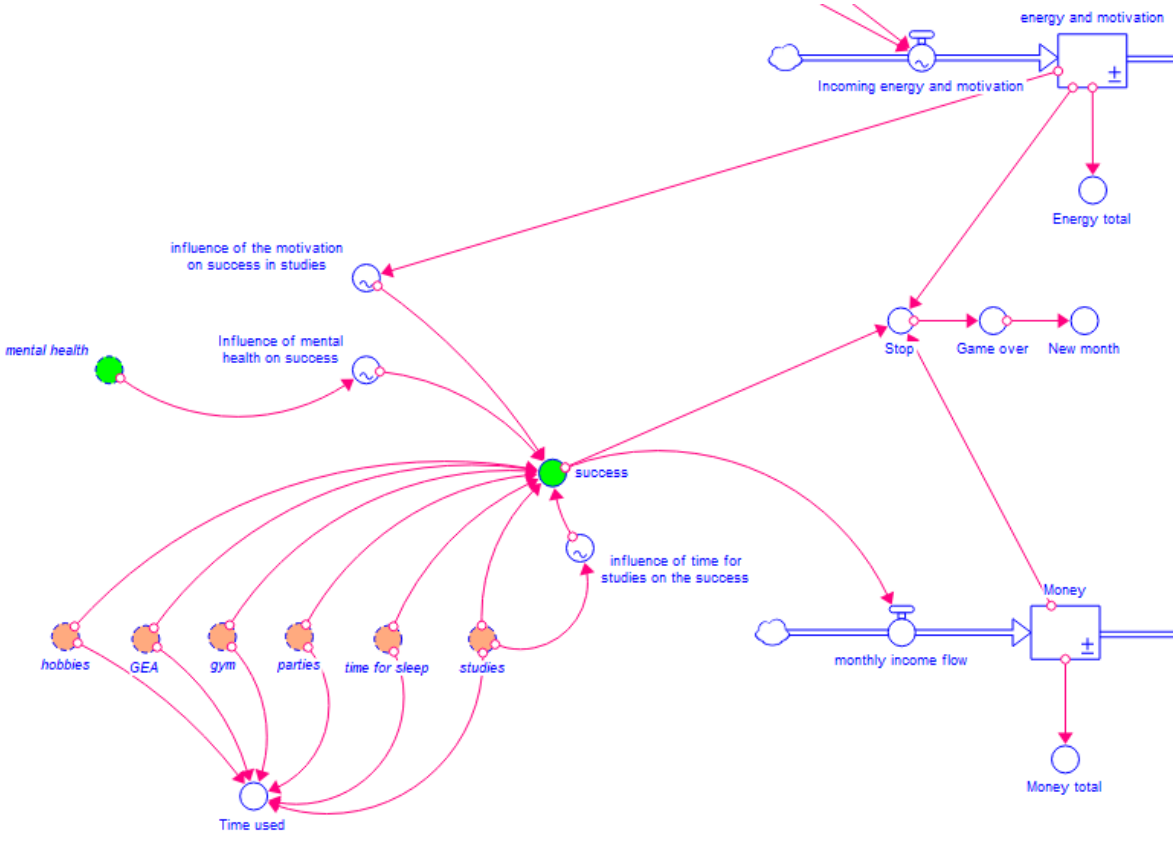


*Figure 5. Success Sector*

**Money Sector.** So, in the case of a *success* value that satisfies the condition, the student receives a scholarship of €1000 (*Money* stock = 1000). However, just getting money is not enough, it is also important to distribute it correctly. This is the third challenge. The stock of *Money*, from the inflow side, is affected by *success*, that is, the presence or absence of a scholarship. On the outflow side: expenses for *food*, *GEA*, *housing*, *parties*, availability of a monthly subscription to the *gym*.

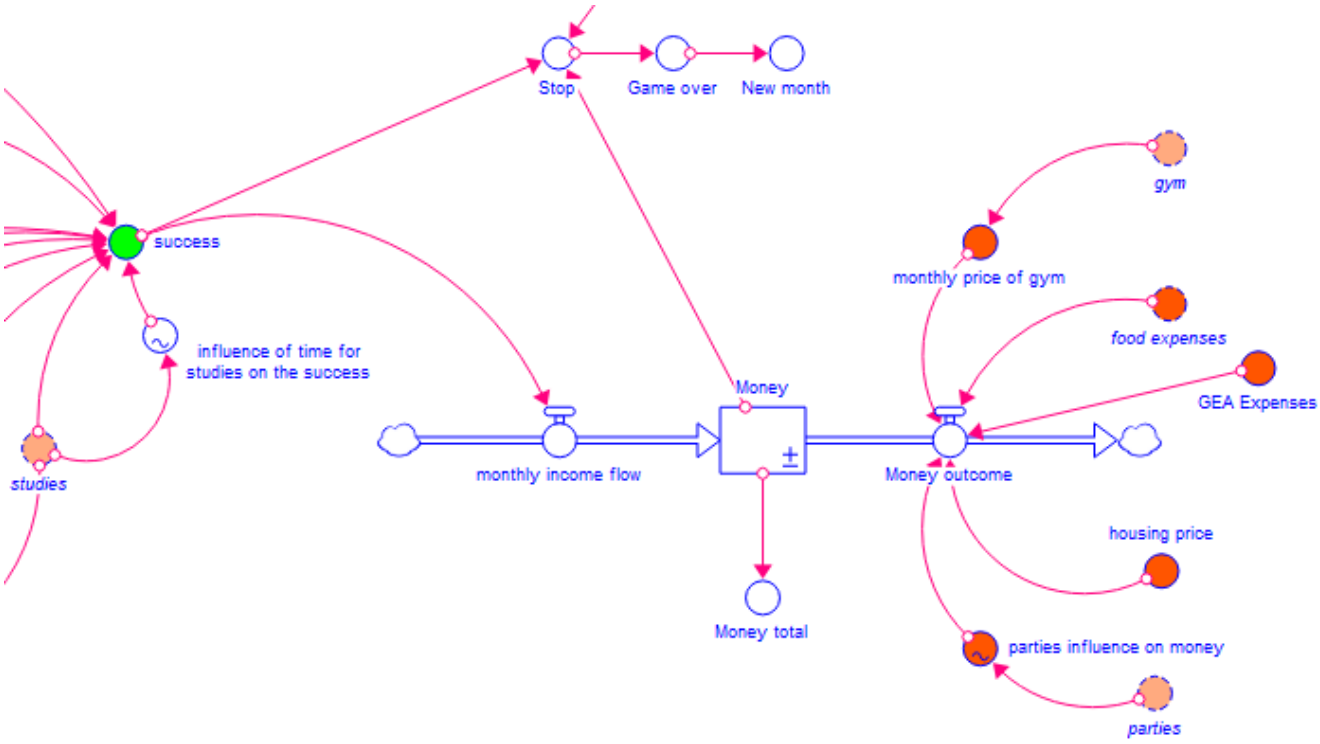


***Figure 6. Money Sector***

**Interface.** Since the interface plays a major role in the development of the skills listed in the first paragraph in a potential player of the age of a high school student, the developers were guided by such guidelines as non-linearity, intuitive comprehensibility, completeness of the information provided, interest arousing, logic, moderate complexity. So, for example, to visualize a student's room, a 3D model was built in the software package for creating three-dimensional computer graphics "Blender" and then rendered from different angles. The action time selection pages for each action are separate to give the player a better understanding of the action and time estimation. Results are displayed at the end of each month.

Interface can be previewed in Fig. 7.

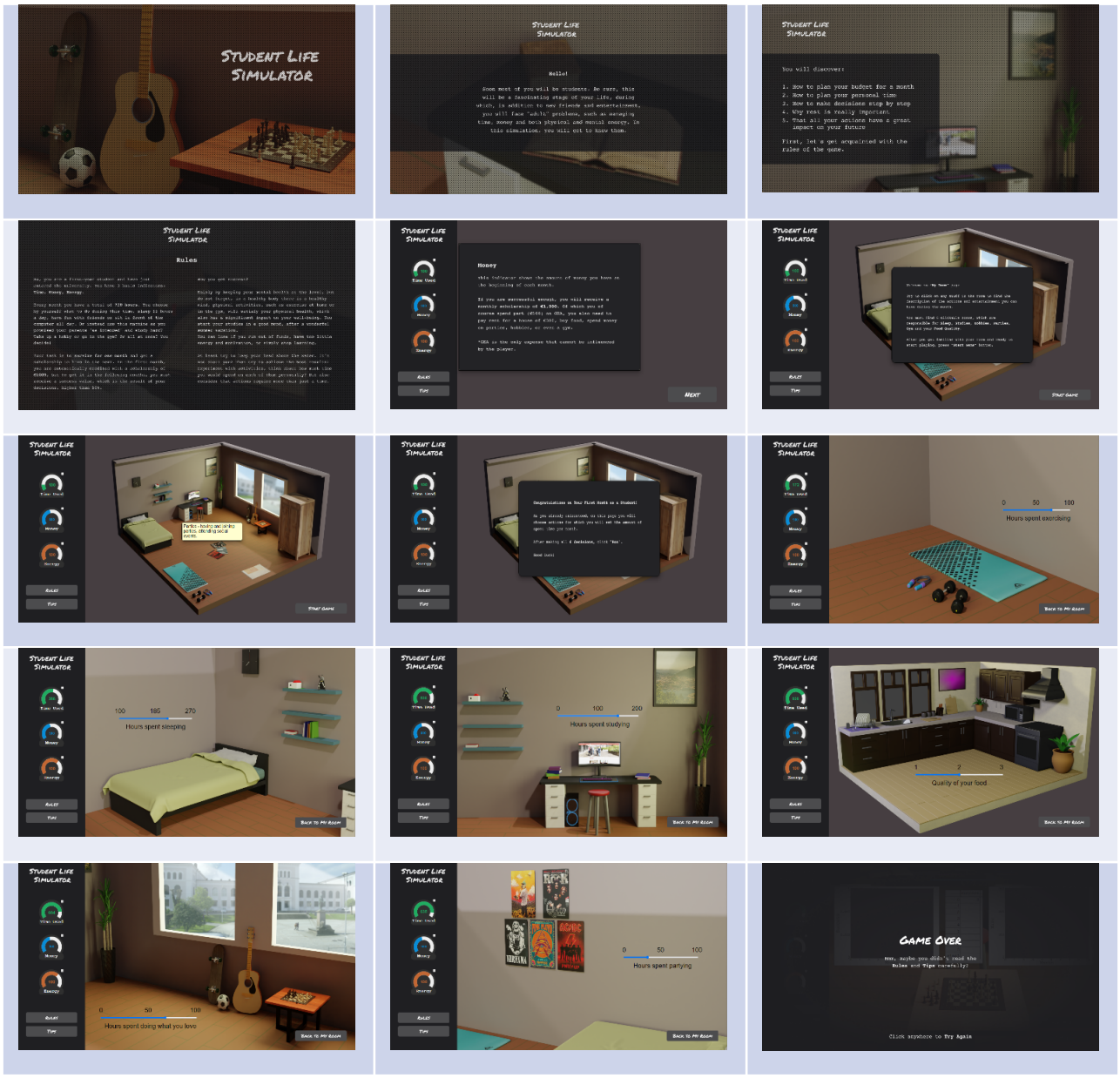


***Figure 7. Interface Pages***

## *References*


1. Alessi, S. (2000). Designing Educational Support in System-Dynamics-Based Interactive Learning Environments. Sage Publications.
2. Davidsen, P. (2000). Issues in the Design and Use of System-Dynamics-Based Interactive Learning Environments. Sage Publications.
3. Maier, F.; Größler, A. (2000) What are we talking about?-A taxonomy of computer simulations to support learning. John Wiley & Sons, Ltd.
4. Reif, F. (1987). Instructional design, cognition, and technology: Applications to the teaching of scientific concepts. Wiley Subscription Services, Inc., A Wiley Company.
5. Tufte, E. (2001). The visual display of quantitative information. Graphics Press.
6. Spector, M. (2000). System Dynamics and Interactive Learning Environments: Lessons Learned and Implications for the Future. Sage Publications.