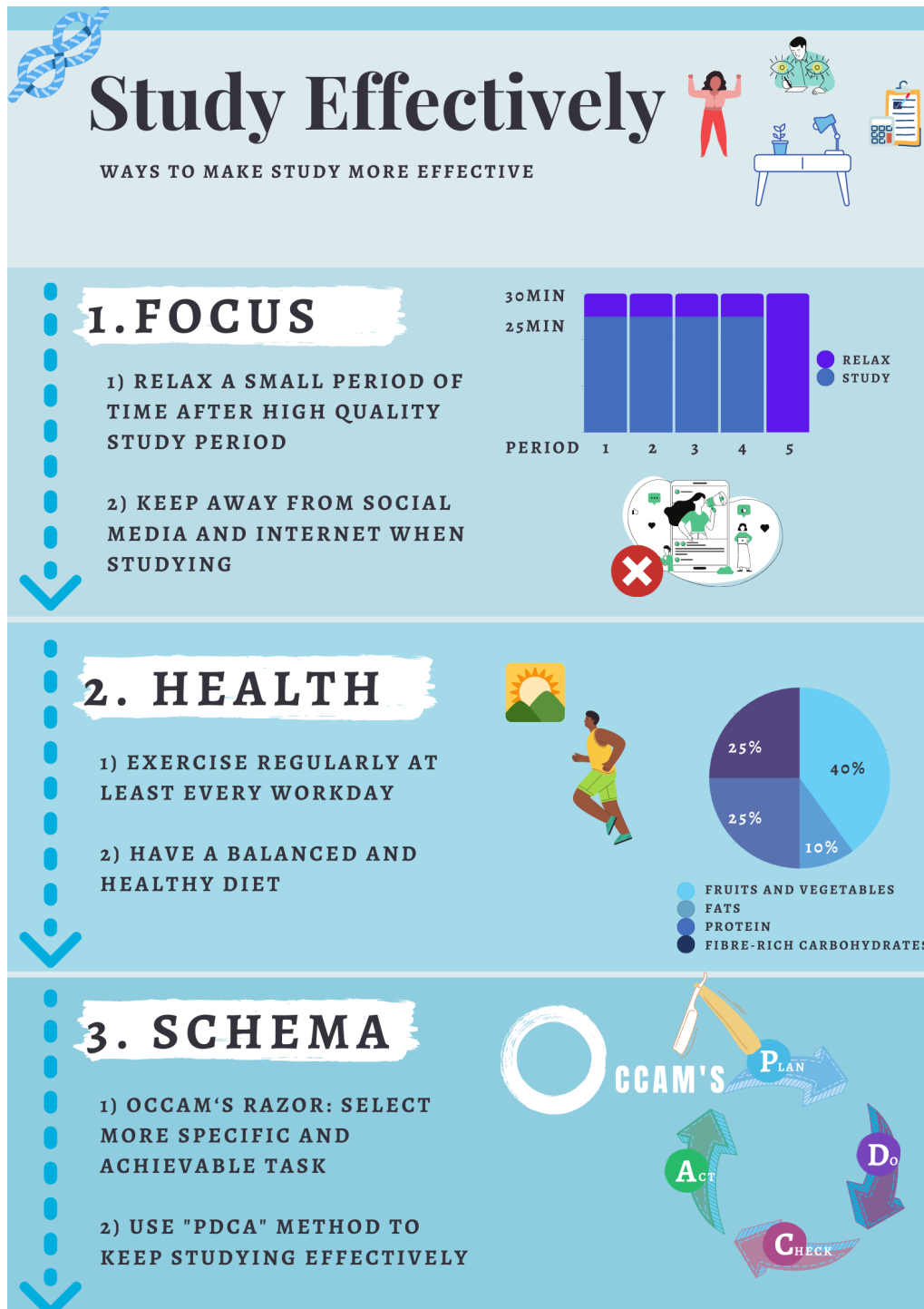


# Study Effectively Infographic

## Information Visualization(CI6221) Assignment

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Huang Fan - September 20, 2020



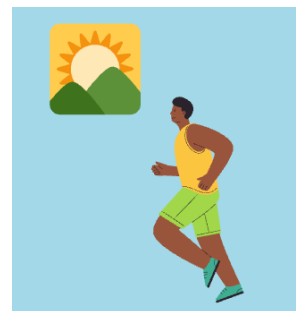
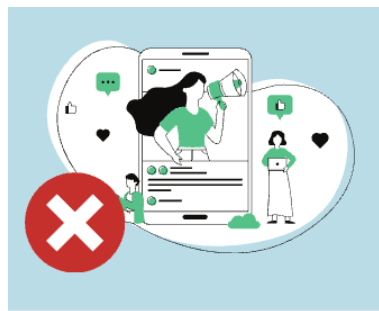
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## Introduction

I choose "Study Effectively" as the theme of this assignment. Through the retrieval, analysis and aggregation of relevant information, I come to three very constructive suggestions. These three suggestions are respectively elaborated from three aspects of focus, health and scheme. I hope to provide the audience with these three progressive and implementable approaches.

Specific words and phrases used in the context:

1) Illustration images: refers to the anthropomorphic or quasi object elements attached to the text, which play a supplementary role in explaining or appreciating the content of the topic. Generally, it uses realistic or slightly abstract painting techniques.



**Example of illustration images**

2) Audience: refers to the person who watch and enjoy the infographic.

## Problem statement

With the continuous progress of history, human civilization is continuously improving with the ongoing efforts from generations of great men and sages. Looking back at the past few hundred years, the labour efficiency of human civilization has been rising repeatedly and tremendously due to the industrial revolution, which also promotes the change of social lifestyle and work rhythm. In this context, how to maintain an efficient and long-term sustainable learning and lifestyle method becomes a more and more critical issue.

Lifelong learning is not only an attitude towards life but also a valuable ability. As the knowledge that people need to learn becomes more and more complex and

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challenging, if we can realize the importance of efficient learning earlier and improve it, I believe we will certainly avoid a lot of trouble in the future.

## Data collection

The main points of the infographic I made lie in three aspects. The analysis and data source of these three parts are as follow.

### 1. Focus

Researchers have found that people's ability to concentrate their minds reaches its peak at about 40 years old, and then begins to decline. It indicates that peoples' study efficiency will inevitably fall after 40 years old. In modern society, competition is increasingly fierce [1].

Psychologists point out that a person's mind can only focus on a certain amount of information (about 110 bits/s) at one time. Even if a person enters the "mind flow" state, it can only ensure that the person is efficient in the process of concentration. However, this efficient state will soon disappear, considering that people will feel tired and hungry [2].

#### 1.1. A short break after intensive study

Even if you enter a very efficient learning state, the duration of this state is tough to be very long. For most people, the most important thing is how to adjust their condition better and faster in the rest time, and then enter the next efficient and intensive learning cycle.

According to the concept of traditional Chinese medicine, people's energy of mental concentration is a kind of consumables, which can be supplemented by rest or meditation. When a person's mind flow state is interrupted, or the person lost focus on a particular topic, it can be recovered by resting or shifting attention.

There are many time management methods around us. There would not be a perfect method for all of us, while one person could always discover a suitable way. Here we introduce a well-known time management method: "Pomodoro technique". The core of this method is to use a timer to divide half an hour into 25 minutes of working time and 5 minutes of rest time. After four cycles, take a rest of 15 to 30 minutes. And people could always adjust the specific study period as long as it fits them.

#### 1.2. Stay away from social media and electronic devices when not necessary

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It would be better to stay away from the media when working or studying. A famous researcher, Neil Postman, believes that with the increase in the use of modern technology (such as television) would often have a negative influence on people's attention capabilities. Internet browsing may have similar effects. Convenient and fast operation methods make most Internet users spend a lot of time on ordinary websites [3]. According to research, the media could have a significant negative impact on the learning effect. Even if the use of the network is only to retrieve the specific information, technology providers would often try to attract people to access information unrelated to the original purpose by various means, and try to divert people's attention for a long time [4].

## 2. Health

A healthy body would make a significant contribution to many parts of our daily lives. What's more, a healthy body and healthy living habits will make us feel energetic and help us to enjoy our beautiful lives better.

### 2.1. Exercise regularly

A study shows that exercise can not only improve health but also improve mood and even increase workload by 72%. Low-intensity aerobic exercise is a good way to improve efficiency. More and more companies allow employees to exercise at work, such as Google. A Danish study also showed that proper training could help to improve heart and lung health. Proper training would also increase productivity and reducing the probability of illness [5].

The purpose of the exercise is to regulate mood and physical energy, but not to enhance muscle strength, so it is better to choose tasks that are easier to adhere to and shorter each time in daily activities. Choose the sports you like, rather than regard exercise as a trivial matter.

Exercise at the end of the day is not conducive to improving the exhausted body. Exercise in the morning or at noon to increase brain power and productivity is a better choice [9].

### 2.2. Eat healthy and balanced

According to the WHO (World Health Organization) report, a healthy weight person consumes about 2000 calories a day, and energy intake should be balanced and nutritious consumption.

For adults, a healthy diet should be noted [11]:

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- 1) Based on high fibre starchy foods such as potatoes, bread, rice or pasta
  - 2) Drink more water
  - 3) At least 400g fruits and vegetables
  - 4) Free sugars with less than 10% total energy intake (all sugars added to food or beverages by the manufacturer, as well as naturally occurring sugars in honey, syrup, juice and juice concentrate)
  - 5) Less than 30% of the total energy intake of fat [10]. Unsaturated fats are superior to saturated fats and trans fats. The reduction of intake of saturated fat and trans fat are good to maintain health [12].
  - 6) Less than 5 g/day salt. [13]

There are many opinions on the dietary structure. I chose one that is more consistent with the WHO's recommendation [14]: 40% fruits and vegetables, 25% fibre-rich carbohydrates, 25% protein and 10% fats.

### 3. Scheme

For many components in our lives, a helpful and practical scheme would not only help us to conduct the study process without omissions but also shorten the check procedure at last. Moreover, an iterative method is also very precious when facing a long-term and complicated study project.

#### 3.1. Application of Occam's razor in time and plan management.

Suppose there are many theories about the planning of a day or a period, and each of them can make the same accurate expectation. In that case, the most practical scheme with the least assumption or the least uncertainty should be selected [15]. This theory encourages people to choose more deterministic and concise methods. Then we can draw such a conclusion that compared with important and clear-cut matters, a simple scheme is more conducive to people's thinking and decision-making. Less important trivia and solutions with too much uncertainty should be removed and ignored in most cases.

#### 3.2. Adopt iterative and efficient plan execution mode, such as PDCA method

The results show that the overall efficiency would improve remarkably after the PDCA method is used to optimize the task plan[16,17]. PDCA is a cycle process of planning, execution, inspection and action (also known as an adjustment). First, formulate the goal and plan, and then implement the goals and plans. After that, evaluate the data and results in the implementation phase and compare them with the expectation. Finally, improve the plan according to the evaluation and further plan. The key to the PDCA

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method is to evaluate the progress and results periodically. Secondly, it can decompose an enormous task, and then repeat the PDCA cycle for many iterations until success. It is another perspective to summarize the PDCA as a management system with development and continuous self iterative optimization. It has high fault tolerance and adaptability in practice.

## Tools and techniques

### 1. Tools:

Design and modify on the website “Canva”, which provide useful design tools and illustration elements. This website is easy to learn and use for me compared with the others.

I also use the NTU online library and Google Scholar to search for the specific papers and e-materials.

Also, I choose the search engine Google Search to obtain and learn the information that I was not familiar with before.

### 2. Techniques:

1) Organize and aggregate information and draw them into charts. I use the bar chart and pie chart to suggest an effective study plan in periods and a healthy diet composition separately, which would give the audience a vivid expression of information but not some pale word lack of visual expressiveness.

2) Enhance users' perception and acceptance of patterns and themes by increasing visual expression. For instance, in the top-right part of the infographic, people would notice that there is a combination of small illustration images representing Focus, Health, Scheme and Study Table. What's more, I put Focus, Health and Scheme illustration images in a triangle-shape position, which indicates those three parts could consist of a stable system to make the study process itself more sustainable and firm.

3) Use conventional information to enhance the expressiveness of the topic. For example, use the knotted rope to convey the expression the study, which in the history of human civilization human using knotted rope is one of the evidence indicating human possess the ability to record and even learn.

4) Use design elements to show implicit logical or sequential relationships. For example, I use the image of a razor to connect the “Occam's” word with “Plan” part in the PDCA image to express my suggestion that people should use the rule of “Occam's Razor” in the “Plan” part of PDCA method.

5) Use the layout and combination techniques in design to show the hidden information. For example, I use three arrows from the top to the bottom of the infographic to reveal the hidden priority of my three separate suggestions.

6) The mapping and hinting of a classic transaction are generated by stacking and combining simple elements (for example, the image combination of the letter O and the razor refers to the Occam razor).

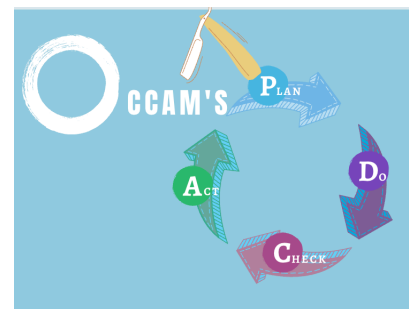
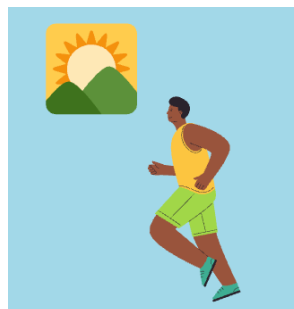
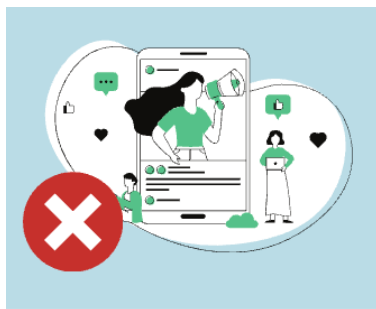
7) Through the adjustment of font size, guide the audience's reading order. At the beginning of drawing the infographic, I chose a smaller font size for further statement part in three suggestion. However, I found that when people have the first glance on the infographic, their attention would be attracted by the charts and illustration images at first, which is not my intention. Then I decide to make the font size bigger so that the illustration images will not distract the audience.

## Application of theories to design

The principles and theories to design are tools used to format the elements of design. Those principles are the basic rules when creating the infographic.

### 1. Gestalt theory of visual perception

This theory helps the designer to use the combination of small illustration images or elements to convey a more complicated connotation.

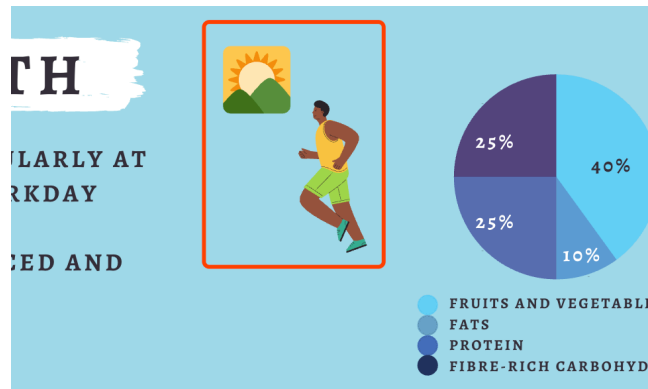


### Combination of small elements

Human inherently looks for order or a relationship between various elements. People tend to observe and analysis from the perspective of a bigger image rather than the individual component. For example, the middle picture includes two parts: rising sun and a running man. They are not even overlapping. But they are quite close comparing with other elements in the infographic. The audience would prefer to understand that as a

whole image, which depicts a man running in the morning. And it is why I choose to place these two small images closer.

## 2. Details - relative distance and position



**Example 1**

### 1) Gestalt Principle - Proximity.

Closer things appear to be more related than things that are farther apart. Taking the example 1, the illustrative images in the red rectangle have the smallest relative distance compared with other elements. Therefore, the audience would relate two illustration images in red rectangle as one part but not others.

## 3. Layout



**Example 2**

### 1) Gestalt Principle - Similarity.

People tend to group similar things. People tend to think they have the same function. The similarity of two headlines with the same background in the above picture makes



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audience intend to understand these two parts in the whole infographic share the same function.

2) Unity and placement using shape.

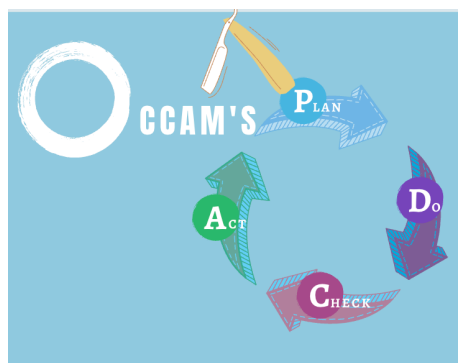
Shapes and illustrative images of blocks are the same, which significantly

3) helps to unify the holistic design and makes the infographic more simple and straightforward.

4) Unity/Harmony: using skills of repetition and rhythm.

In example 2, the repetition of the design pattern of two blocks and the background color rhythm both help to improve the unity of the design.

4. Complicated combination.



**Example 3**

1) Gestalt Principle - Continuance.

People tend to recognize elements arranged on a line or curve are perceived to be more related. The elements of “Occam’s”, “Razor” and “Plan” share the same line direction. That design would imply people that they should use the rule of “Occam’s Razor” when making a “Plan”. And similarly, the “Plan”, “Do”, “Check” and “Act” elements are in one circle, which indicates they also have a connection between each other.

2) Unity using space.

That example could represent the application of unity using space connection. Shapes closed to each other will receive more attention and have a stronger relationship.

3) Unity/Harmony: using skills of repetition and rhythm.

In example 3, there are four parts combined to illustrate the concept and features of the PDCA method. Firstly, I use repetition of four arrows to indicate the four steps of the PDCA method sharing similarity in shape and having recycled direction. And then, I use four different colors to formulate a color rhythm.

5. Holistic design method

1) People could easily understand the theme and main content of the infographic thanks to the application of four-layer design distinguished by deepening color in blocks from up to down. Also, the implementation of illustration images would help the audience understand the suggestions more quickly and precisely.

2) The usage of Grids

Grids formed by consisting structure could help to make reading more smoothly. People do not prefer to adjust their minds or eyes to unexpected changes and unorganized information.

6. Block design



Example 4

1) Variety

The design variety introduces interest through contrast. People could easily find a balance between the headline "HEALTH" and specific suggestions under it.

2) Visual weight variety

In the bar chart, four different color value was applied, which does help to create a difference in correlation between the elements and theme.

3) Balance

The equal weight among the words and design elements strengthens the visual balance.

## Evaluation of infographics

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### 1. Attracting theme and explicit content

In the age of information and computer, people are facing more and more challenges in their study and work period. Even though we possess a faster and more accurate search engine, we still need to understand the necessary knowledge and rules that are also becoming harder and harder to obtain. Most of the people faced or are facing problems during their study. It is not reckless to conclude that it is still significant to find and sustain an effective study strategy methodology for each one of us. The theme of how to study more effectively would successfully attract most people's attention.

The whole infographic contains only three major parts. There is no doubt that the study has always been a headache for most people. The audience would feel stressed when facing this topic. And if there are too many "suggestions", it would make them feel even worse. The brief and explicit content would convey a hint that this infographic is providing an easier way to study. Consequently, people would be delighted to look into this infographic.

### 2. Practical suggestions

The collection of a large number of data helps the suggestions in the infographic possess sufficient authenticity. Through the study of a large number of materials, I concluded three chief suggestions and six small detailed suggestions. These suggestions comprehensively consider the feasibility, universality, sustainability, iteration and implementation priorities. The iteration would provide a methodology with stronger operability and adaptability to the audience. After reading, the audience could obtain a practical understanding of how to study better under their specific circumstance.

### 3. Implementation of design skills

#### 1) Unity

Many design techniques help to enhance the unity of related information. The harmony within unity also makes the infographic easier to read and understand.

#### 2) Variety behind unity

If everything is overly structured and unified, the result can be so predictable and repetitive that it becomes boring. The variety in elements and combination of illustration images contribute better express information.

#### 3) The balanced weight of components

The balanced weight dramatically improves the aesthetic value of infographic. It would help to attract the audience's attention and enlighten the audience to continue reading.

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#### 4. Considerations in details

##### 1) The use of Illustration images

In addition to the classic text introduction, data charts and charts, a small number of illustrations are also helpful. On the one hand, it helps to attract people attention and keep them continue their reading. On the other hand, it improves readability and variety.

##### 2) Application of convolutional elements

The usage of convolutional elements like knotted rope provides the audience with culture implementation and connect with their knowledge, which could help enjoy themselves during reading. It could also contribute to the understanding and acceptance of theme and content.

## Conclusion

I have to admit that I used far more time to do this individual project than I expected. However, this is an impressive and self-improving journey for me. I want to thank my family for supporting me to conduct this informative course. And thank you, Professor, for teaching me such valuable and practical knowledge.

I could not even believe I, an ordinary computer programmer, could design such a good job. While I was completing this assignment, I learn what a good design work is, how should I build that, and why should I design that way. I also learnt the right analysis of critical points and steps.

I tried my best in these days, but when I look back my works there are still some aspects that could be improved:

1. Some of the illustration images involve extended referential meanings and may require the audience to make appropriate connection and thinking. For example, "Don't use social media" and "Occam's Razor."
2. The assignment time is limited, and there are many innovative ideas I do not have time to experiment and implement one by one. For example, if I have more time, I can make a layout with more aesthetic sense, or try more attempts from the perspective of layout balance (like radial balance or asymmetrical balance).
3. The discussion range on implementation of design theories could be more wide and detailed if I have had more time on this project. I have post this infographic and report on my personal website (URL: [muyuhuatang.github.io](http://muyuhuatang.github.io)), and I will try to improve this infographic and report in my spare time.

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## References

- [1] Fortenbaugh F C, DeGutis J, Germine L, et al. Sustained attention across the life span in a sample of 10,000: dissociating ability and strategy[J]. *Psychological science*, 2015, 26(9): 1497-1510.  
1497-1510. doi:10.1177/0956797615594896. ISSN 0956-7976. PMC 4567490. PMID 26253551.
- [2] McGuinness, Mark. "Mihaly Csikszentmihályi – Does Creativity Make You Happy?". Lateral Access. (URL: <https://lateralaction.com/articles/mihaly-csikszentmihalyi/>)
- [3] "Turning into digital goldfish". BBC News. 2002.
- [4] Lodge, J. M., & Harrison, W. J. (2019). The Role of Attention in Learning in the Digital Age[J]. *The Yale journal of biology and medicine*, 92(1), 21–28.
- [5] Dugdill L, Coulson J C, McKenna J, et al. Exercising at work and self-reported work performance[J]. *International Journal of Workplace Health Management*, 2008.
- [6] Drannan J D. The relationship between physical exercise and job performance: The mediating effects of subjective health and good mood[D]. Bangkok University, 2016.
- [7] Sjøgaard G, Christensen J R, Justesen J B, et al. Exercise is more than medicine: The working age population's well-being and productivity[J]. *Journal of Sport and Health Science*, 2016, 5(2): 159-165.
- [8] Haskell, W. L., Lee, I. M., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., Macera, C. A., Heath, G. W., Thompson, P. D., Bauman, A., American College of Sports Medicine, & American Heart Association (2007). Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Circulation*, 116(9), 1081–1093. <https://doi.org/10.1161/CIRCULATIONAHA.107.185649>
- [9] "HOW EXERCISE IMPROVES PRODUCTIVITY AND YOUR BRAIN FUNCTION". Burke Britton. 2018. (URL: <https://www.bbfp.com.au/latest-articles/how-exercise-improves-productivity-and-your-brain-function>)
- [10] WHO. "Healthy diet". 2020. (URL: <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>)
- [11] Hooper L, Abdelhamid A, Bunn D, et al. Effects of total fat intake on body weight[J]. *Cochrane database of systematic reviews*, 2015 (8).
- [12] Mozaffarian D, Fahimi S, Singh G M, et al. Global sodium consumption and death from cardiovascular causes[J]. *New England Journal of Medicine*, 2014, 371(7): 624-634..

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[13] Te Morenga L A, Howatson A J, Jones R M, et al. Dietary sugars and cardiometabolic risk: systematic review and meta-analyses of randomized controlled trials of the effects on blood pressure and lipids[J]. The American journal of clinical nutrition, 2014, 100(1): 65-79.

[14] Neeti Jaychander. "The perfect balanced diet chart to be healthy". FEMINA. 2018. (URL: <https://www.femina.in/wellness/diet/the-perfect-balanced-diet-chart-to-be-healthy-111567.html#fruits-and-vegetables>)

[15] Stanford Encyclopedia of Philosophy, "Logical construction". First published Wed Nov 20, 1996; substantive revision Tue May 21, 2019. (URL: <https://plato.stanford.edu/entries/logical-construction/>)

[16] Nsafon B E K, Butu H M, Owolabi A B, et al. Integrating multi-criteria analysis with PDCA cycle for sustainable energy planning in Africa: Application to hybrid mini-grid system in Cameroon[J]. Sustainable Energy Technologies and Assessments, 2020, 37: 100628.

[17] Prashar A. Adopting PDCA (Plan-Do-Check-Act) cycle for energy optimization in energy-intensive SMEs[J]. Journal of cleaner production, 2017, 145: 277-293.