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## Pedagogy final report

### Ideal Education System

This paper is my answer to the question ‘What is your ideal education system?’, and my answer is that ‘ideal education system is “ ”. But before the conclusion I explained logics behind the answer. The stream of discussion on this paper is like below.

- Set the structure around education
- Focus on a function, what forms education system
- Set an ideal image of person
- Describe my ideal education system.

### 1. Structure under this discussion —what to think about?

Discussing ideal education system, we have difficulty even defining it. A word ‘Education’ is defined , if with very simple words , as ***a process of growing a person.*** Upon this definition, a good (or ideal) education means a process of growing a good person. At this point, we face a extremely abstract and difficult question ‘What is a GOOD person like?’. I think any of us, living human, doesn’t have solid answer to this question. Therefore, in order to be ‘scientific’, we have to follow some procedure when discussing ideal education.

As a procedure to avoid dangerous discussion, we could think about **structure**. The quotation below is a structural viewpoint about science, on which this paper will discuss.

What is structure and structuralism? As has been mentioned, it is impossible to describe regulations of getting signifié as identity from phenomena.[...]Then, does it mean nothing can be described clearly ? No, the exception is form of relation among sign, which has no content.[...]Structure is something made by substituting signifié for signs of a form. In my opinion, science is the process of coding phenomena by such structure.

(K.Ikeda,1990)

Here we will **code** education and relationships around it, by using some mathematic signs like kind of **Sets** or **Categories** .

$$S = \{i_s : i_s \text{ an image for society thought to be 'ideal'}\}$$

e.g.  $i_s$  = economically-developed, democratic, socialistic, sustainable, America-first or sth.

$$P = \{i_p : i_p \text{ is an image for a person thought to be 'ideal'}\}$$

e.g.  $i_p$  = creative&hard-working, wise&temperate, obedient or sth.

$E = \{e : e \text{ is an image for a education system thought to be 'ideal'}\}$

e.g.  $e$  = traditional, progressive, East-Asian-like, or sth.

Now we can define these **arrows**(morphisms) .

$$f : S \rightarrow P$$

$$g : P \rightarrow E$$

$$h : E \rightarrow S$$

The function  $f$  describes some ideation or judgement about “what is a ideal member of certain society like?”. And the function  $g$  represents the ‘calculation’ in which education system is derived from ideal person given. the function  $h$  represents the performing certain education system. Among them, the first thing we would think about is the function  $g$ .

How can we describe  $g$  , function making education system form images of ideal person ? Actually, we can understand a little bit , by imagining some concrete examples. However, in order to discuss not *what to teach* but *how to teach*, we’d better to keep discussing abstractly in this part. In current society, these function works actually, but not completely-accurately. There a lot of misjudgment of goals of individual-development(  $\in P$ ), even if the ideal image of society(  $\in S$ ) is given. To given image of ideal person(  $\in P$ ), current education system isn’t perfect as the answer. Then, a concepts of ‘accuracy’ of the functions would be installed. That means, accuracy of  $f$  is how correctly the deriving of ‘ideal person’ from given ‘ideal society’ is. So are about  $g$  and  $h$ . If we can define ‘accurate’ function  $g$ , that gives us an general answer to the question.

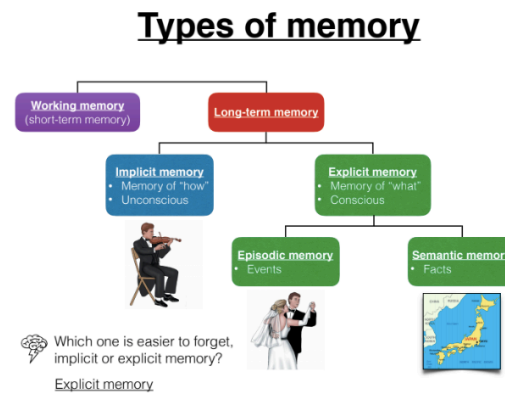
To tell the brief conclusion, this paper will approach to the problem generally, widely, and abstractly without defining ‘what ideal person is like’, by focusing on the function.

## 2. the function deriving education system

### —— deductive approach based on fundamental theory of neuroscience

In this part, the function  $g$  will be understood by dividing the image of ideal person into several elements(if math. words are needed, it’s like  $g = g_1 \circ g_2 \circ g_3$ ). The image of a person, as a human resource, could be consist of skill(ability), knowledge, and character. For instance, ‘ideal’ person for democratic society might be required to have skills logical discussion and thinking, to have broad and wide knowledge ncececcery for making judge, and to behave responsibly, and respectably. Here we regard all the factors as patterns of structure in their body, especially neuron circuit in their brain. So the image of a person could be regarded as kinds of memory in the broad sense.

Memories in human brain has several type as figure 1 shows. Working memory is a short-term memory which is used for something needed to be recalled instantly. Long-term memory has two types, implicit memory and explicit memory, and explicit memory is divided into episodic memory and semantic memory.



Slide from the lecture Fundamentals of Neuroscience —E2, Kyoto University, Zenas Chao.

The three factors of personal images above could be classified into these types of memory. Skills are mainly stored as implicit memory, such as how to ride bicycle, to play the violin, and so on. Knowledge is stored as explicit memory, usually as semantic memory. And characters, which is accumulation of movement patterns, are stored as both episodic memory(What happened when I took that action at that time), and implicit memory(How should I behave in such situation). Based on these classification, we can make some scientific approaches to each types of memory.

Explaining very simply, we have two big way to get such memories(or some are called experience). Classical conditioning, and operant conditioning. The former needs **repeating**(Like very famous experiment Pavlov's Dog ), and latter requires neurotransmitter (e.g. Dopamine), which is released when you **feel reward**.

In simple words of science, we can approach to ideal education(of course no matter what the ideal person is)by setting environment which leads us to get deep memories of high quality required for ideal person. Enjoyable equipment for self-studying may let student to repeating materials without stress or being bored. Attracting lecture with some humor or stories in Theater-like classroom can have strong impact on students. As these examples shows, education systems are needed to be able to **provide various kinds of experiences with strong intensity, such as discovery of something, and to get rid of children's extra stress when they learn.**

### 3. The function deriving education system

#### —— inductive approach by integrating some examples

Tomitaro Karasawa, a researcher of education history, talked about ideal image of person in his book 理想の人間像(*Ideal Image of Person*).

After all, it is the turning point of their life when the children have their dream or goal decide to make progress toward it. Ancient people called it self-making-age. When children experience self-making, they do it more often with concrete image of real person, than with abstract and conceptional image. For example, children have greater interest in historical person or his/her biography than in stream of history itself. It is difficult to cultivate children's mind by saying 'love' and 'peace' because it's too abstract, but by introducing Nightingale and Schweitzer, we can make the children realize the meaning in the way unique to child.

(T.Karasawa, 1964)

There are some examples in the book, such as Washington&Edison in U.S. Washington is a symbol of foundation of democracy, and Edison is a symbol of frontier spirits in the field of science. Another example are Lenin&Kulibin in Soviet. The former is a symbol of integration of communism nation, and latter, who is a innovator of some technical devices, is a symbol of hard-working and respect for technology. Children are led to encounter with these symbols, in other words heroes, and then make effort to be like him/her. This encounter is an experience which has quite strong intensity.

Here I introduce my experience. The example is my cram school. When I was preparing for the entrance exam of university, I went a cram school for only world history, with interesting system. The details of the systems is below. After some lectures, students begin walking around in the city making pairs with classmate, and teaching some knowledge to each other. And then, each of us is given some task to explain certain historical events, person, etc. After that students are divided into 7-9 groups, and Fastest Finger First Battle starts. The lecture and tasks are quite organic, rather than systematic. That means, the teaching style is inter-sectional(section is each part in the usual textbook). There students can experience of discovery of similarity between historical events. And through the Fastest Finger First quiz Battle, students can get rid of stress during routine simple, and boring repetition of memorization tasks.

Summarizing the examples above, we can get similar description of the function  $g$ , which indicates **intense experience, and removing extra stress** when learning.

#### 4.The ideal image of person in the current society.

Integrating the discussion above, an ideal function  $g$  is **the one which provides experiences of strong intensity to children, and gets rid of learners' extra stress**. Now we move to discuss the sets  $P$ , ideal images of person. If the function  $g$  of in not low quality was

given, we want to substitute good image for the function as possible. Here I describe my 'ideal' image of person in the current society.

To form the ideal image, an ability we have to focus on is some sorts of endurance to allow unknown thing to stay in your memory, and I suggest that we give it the word '*Gakuryoku*(学力)', which is now used with very vague definition. That means, we re-define the word '*Gakuryoku*', as the endurance like above.

To bolster up this definition, I will describe a pragmatic logic behind this definition. First I will define 'good definition' in solid words. Definition is an action of giving some words to something. So here I set required condition 'good definition', in an extremely pragmatical way, as below. (1)The definition isn't too far different from the general recognition. (2)By defining it in the definition words, some good or beneficial co-recognition will be provided in that society.

To the condition (1), it would be effective to quote an famous word related to philosophy, 'De Docta Ignorantia'. It is kind of definition of human as Philosophia who pursues Sophia, on the premise that the God is the best and only Sophia. These perception of wisdom is very popular and general, even if people aren't aware of it usually.

And to fill the condition (2), I would like to introduce some harmful misunderstandings about approximation. When understanding a complex thing, we sometime use approximation. But by unaware of it, some serious problems would be caused. These days, especially in Japan, it has become major problem that education inclines to memorization of factual knowledges too much. This problem comes from the misunderstandings of approximation. The score of exams are approximation of how many things they know. And how many things they know is just one part of how wise they are. Not knowing that, education systems go straight to getting the scores of exam. This problem comes from lack of '*Gakuryoku*'. Because people doesn't have enough ability to store complex thing such as how wisdom a person is, without dividing it into elements. Actually, we can never measure accurately how wisdom a person is. How ever, it doesn't mean that we may stop efforts to be accurate (like Taylor Series in some ways). One more example is about politics, especially about democracy. In democratic society, freedom of making decisions about themselves is imposed on the citizens. They are allowed to keep thinking deeply, about complex things like direction of the society. But in some cases, the citizens stop thinking because they don't have enough ability to endure the complexity. In my opinion, emergence of Hitler comes from same problem. The public quit thinking about ethics, politics, and economy, and instead gave hasty credit to very simple and strong words. In this way, the definition of '*Gakuryoku*' above will admonish people of the important ability needed in the current society.

## 5. Ideal system to cultivate the new ability.

In brief, my ideal image person is who has ‘Gakuryoku’, and the function  $g$  is ‘giving experience of discovery needed for the ideal image’. In this last part, I describe concrete system of ideal education.

Based on the discussion above, my ideal education system is the one which provides a lot of experience of facing problem which comes from stopping thinking complexly, and the one which make children familiar with complexity. To be specific, I’ll divide the conclusion into 3 parts, school systems, teachers, and curriculums.

School system should be very progressive. To be exact, it must not be traditional style. In traditional school, the correct answers are always there. This environment will never cultivate that sort of endurance. Children should be free and put into the environment which require constant thinking about various things. Leibniz, an philosopher of monad theory, conceived an idea of theater-style education facilities, which might adapt the image with some modernization.

Teachers of that school will be designers of the educational space. They will be free from traditional role of passing the factual information on, and instead set a lot of events in the school so that children can gain some deep experiences of ‘discovery’. In addition, the teacher should be a ‘hero’ who attract students to certain academics or ideal image of person in un-forcing ways, as Japanese major cram-school teacher have become characteristic or unique to attract interest in recent years.

As ideal style of curriculum, I’d like to make a suggestion about problem-solving style. Some problems are given to the children and to solve the problem they choose which class to take in each semester(which should be shorter than now). So problems are given by teacher, but curriculum are made by children. For lower grade children, the given problems are more concrete and related to living and basic skills. For higher grade, problems become more abstract and complex. This system of education is like a story-based game, in which we collect some teammates or weapons to beat down the enemy. By solving problem, children can feel a kind of reward, as they sometimes devote themselves to games. It also fills the condition ‘getting rid of extra stress when learning’

As a overall conclusion, my ideal education system is such problem-solving style school designed by teachers, which provides some intense experience of discovery or reward.

## References

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