Research Patterns: A Pattern Language for Academic Research

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1   Introduction

The research activity is one of the most important elements in the educational institution such as universities. And now, the research activity is desired to the undergraduate students as well as the graduate students and professors. For the students to do that, it is necessary to make an environment that the students can both learn how to study and work on the research activity. But it is difficult to make an environment that the students feel easy to learn how to research, and to receive instructions from professors and elder members. It is because that this tacit knowledge is not formalized into words to be shared. Now it is needed to be expressed into shape.

In this paper, we propose a pattern language to assist the students who are working on an academic research, which we call "Research Patterns". Research patterns organize the know-how of the research activity. Each pattern consists of the background of frequent problem, and the clue to find a solution in the research activity. Our aim is to support the students to manage their researches by themselves, to make them productive in research.

2   What is "Research Patterns"

At the catalog which is attached in this paper, the know-how of the research activity is described in to a pattern language, based on the concept by Christopher Alexander [Alexander, 1977, Alexander, 1979]. The pattern language is composed by elements called "patterns", and each pattern has written the situation, the problem, and the solution to it.

There are two advantages to describe the know-how of research activity into the pattern language. First, the pattern language has a potential to become a common language among researchers. The common language will make efficient communication and collaboration, and everyone could share the essence of research since tacit knowledge of expert researcher is described. It will be the big help especially to the student who has just started the research. Second, the patterns can be chosen, arranged, or put together by the users in order to apply their situation.

Research patterns consist of 43 patterns, which are listed in the catalog attached in this paper[1]. Each pattern consists of seven items as follows;

- **Name of pattern**
  "Name of pattern" represents the characteristic of the pattern. They are an attractive name, and it is easy to remember.

- **Situation and similar patterns**
  "Situation" tells a situation that pattern can be used and inform about similar the patterns.

- **Problem**
  "Problem" describes the point of the problem in the research activities.

- **Solution**
  "Solution" gives you the clue to solve the problem.

- **Image**
  "Image" expresses the meaning of the pattern simply.

- **Proverb and Saying**
  "Proverb and Saying" assists you in understanding patterns. Proverb may make you motivated.

- **Keywords**
  This lists keywords.

- **References**
  This lists references.

We can never describe tacit knowledge, but we give some clues to get it through the pattern language. To describing patterns for Research Patterns, we referred a lot of literature not only about the research. The books, diaries, and interviews by the creators and business people were also useful for abstracting the know-how of the creative works or social activity. With using the various literatures, we picked up frequent happenings and words and set into each pattern.

3 Category and Proposed Patterns

The patterns are classified into three categories; "Motivation", "Relationship", and "Creativity" (Figure 1). First category is "Motivation". The research activities are based on researcher's inner motivation, and it drives the researcher to concentrate on the research. This category consists of 14 patterns about motivation. These patterns consist of three subcategories such as "relaxing", "excitement", and "impatient".

Second category is "Relationship". The research is worthy to be called "research" when it contributes to the society or the community, so the viewpoint of relationship between these is very important. In this category, there are two subcategories such as "relationship in project" and "relationship in society".
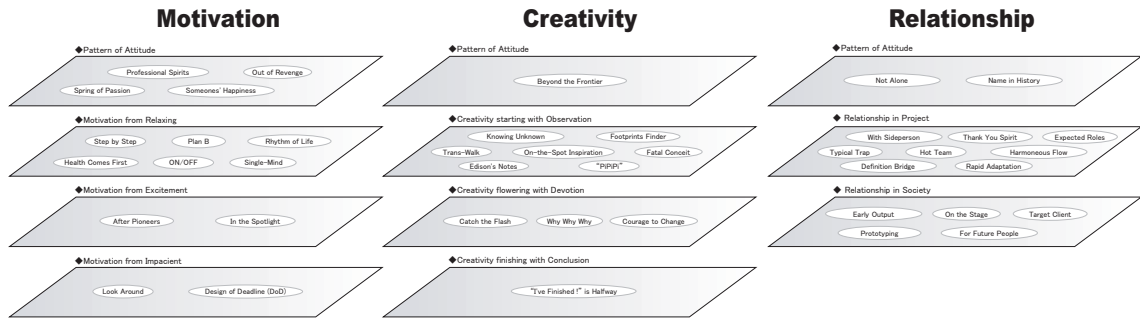
Figure 1: Category Map of Research Patterns

Last category is "Creativity". It consists of 12 patterns which describe the method and the way of activity in the research. They are classified into three subcategories, such as "observation", "devotion", and "conclusion".

Research Patterns consists of 43 patterns as follows:

Intorductional Pattern
No.1 "Sink First"

Category:Motivation
No.2 "Spring of Passion"
No.3 "Out of Revenge"
No.4 "Professional Spirits"
No.5 "Someones' Happiness"
No.6 "Look Around"
No.7 "Design of Deadline (DoD)"
No.8 "Single-Mind"
No.9 "Rhythm of Life"
No.10 "Health Comes First"
No.11 "Step by Step"
No.12 "Plan B"
No.13 "ON/OFF"
No.14 "In the Spotlight"
No.15 "After Pioneers"

Category:Relationship
No.16 "Not Alone"
No.17 "Hot Team"
No.18 "With Sideperson"
No.19 "Thank You Spirit"
No.20 "Definition Bridge"
No.21 "Typical Trap"
No.22 "Harmoneous Flow"

No.23 "Expected Roles"
No.24 "Rapid Adaptation"
No.25 "Name in History"
No.26 "Early Output"
No.27 "Prototyping"
No.28 "On the Stage"
No.29 "For Future People"
No.30 "Target Client"

Category:Creativity
No.31 "Beyond the Frontier"
No.32 " *PiPiPi* "
No.33 "Fatal Conceit"
No.34 "Knowing Unknown"
No.35 "On-the-Spot Inspiration"
No.36 "Trans-Walk"
No.37 "Footprints Finder"
No.38 "Edison's Notes"
No.39 "Catch the Flash"
No.40 "Why Why Why"
No.41 "Courage to Change"
No.42 " 'I've Finished !' is Halfway"

Outroductional Pattern
No.43 "Never Ending Study"

4   How to Use "Research Patterns"

To use "Research Patterns", first the researcher needs to read the whole picture and the description of the categories. Then he could abstractedly understand what the research is. Next is the main stage. He starts his own research, and when he had problems, the catalog is opened. He looks for the same situation or the problem, and get hint to solve it. The communication between the team members become smoother if this pattern language is shared. Once it becomes to the common language, you will save extra discussion.

We hope that this pattern language for academic research helps the students to work on their research activities. In order to evolve this pattern language, we want many people to use this pattern language, and get the feedbacks.

Acknowledgements

of patterns. And, we gratefully acknowledge helpful discussions with Yohei Yumura and Koji Wakamatsu on several points in the paper.

Notes

1   Research Patterns were originally proposed in Japanese paper [Sasaki et al., 2008]

References

[Alexander, 1977] C. Alexander (1977). *A Pattern Language* , Oxford University Press.

[Alexander, 1979] C. Alexander (1979). *The Timeless Way of Building* , Oxford University Press.

[Sasaki et al., 2008] A. Sasaki, Y. Kobayashi, and T. Iba (2008). A Pattern Language for Academic Research in *IPSJ SIG Technical Reports, 2006-MPS-68*, in Japanese.

A Pattern Language for Academic Research Catalog 2008

This catalog may help you.

No more !!

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What is "Research Patterns"

In this study, we propose a pattern language for academic research, which we call "Research Patterns". Each pattern has a set of problem and solution in research activity, which follows the concept of Christopher Alexander, who is an architect, and method of "pattern language". Research patterns consist of 43 patterns, and they are classified into three categories; "Motivation" "Relationship" and "Creativity". To make "Research Patterns", we referred a lot of literature not only about the research. The books, diaries, and interviews of the creators and business people were also helpful. From those we picked up frequent happenings and words and set in to each pattern.

To use "Research Patterns", first the researcher needs to read the whole picture and the description of the categories. Then he could abstractedly understand what the research is. Next is the main stage. He starts his own research, and when he had problems, the catalog is opened. He looks for the same situation or the problem, and get hint to solve it. The communication between the team members become smoother if this pattern language is shared. Once it becomes to the common language, you will save extra discussion.

We hope that the pattern language for academic research helps the students to work on their research activities. In order to evolve this pattern language, we want many people to use this pattern language, and get the feedbacks.
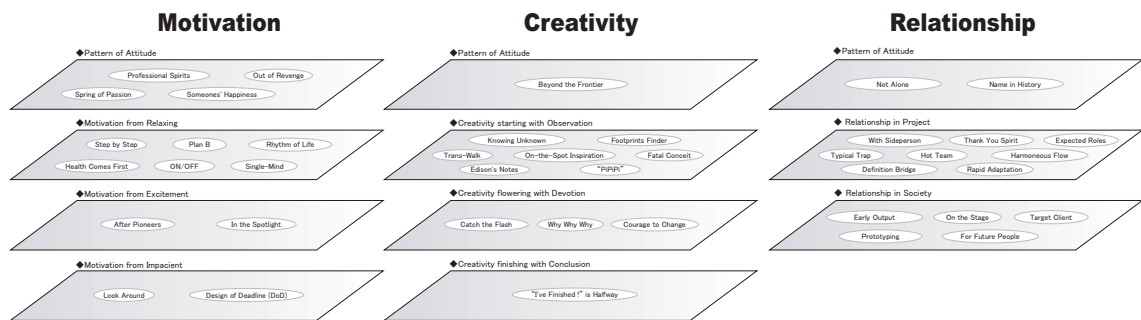
Contents

Intorductional Pattern

Category:Motivation

Research activities are based on your inner motivation, and you should keep it in any circumstances. Patterns for motivation consist of three subcategories such as relaxing, excitement and impatient.

Category:Relationship

Research activities need lots of communication if you only write papers. It is not until "research" that your research contributes to society. Patterns for relationship are composed of two subcategories, which are relationship in project and relationship in society.

Category:Creativity

Research activities need the frontier spirit. Patterns for creativity cover actions and ways to improve the quality of your research. This category is composed of three categories, such as observation, devotion and conclusion.

Outroductional Pattern

Sink First

■ Situation
You are in the run up to your research, or you have just started.

■ Problem
You only think that the days as a researcher will come someday.

■ Solution
"Someday" never comes. You are already a researcher. Every thoughts and activities becomes pabulum.
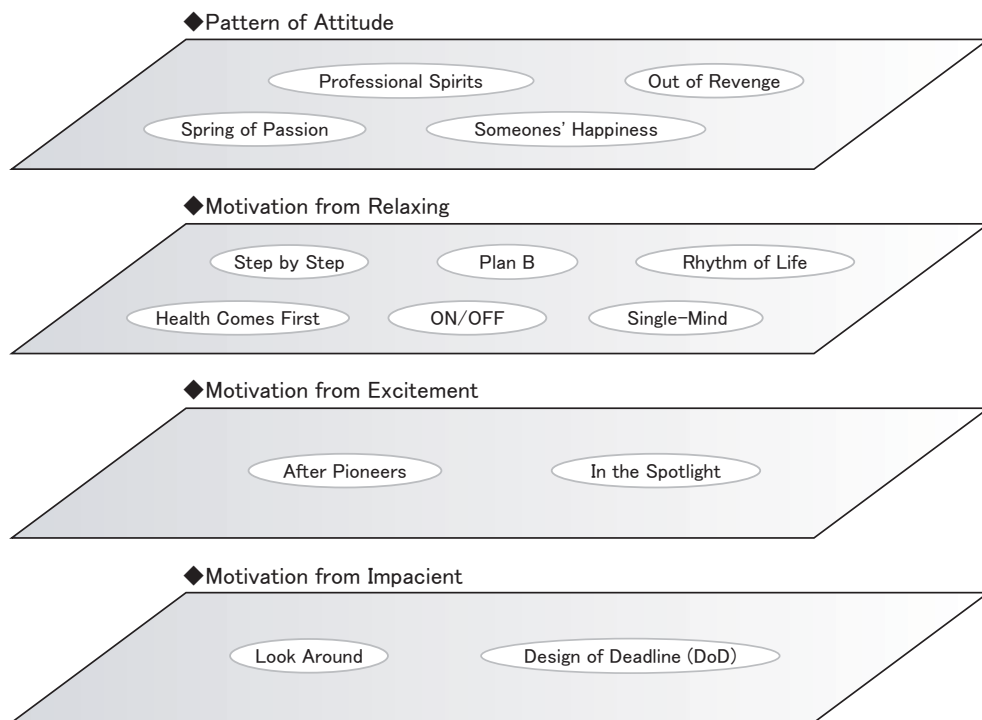
Make hay while the sun shines.

■ Keywords
startline,motivation

■ References

- Itami (2001)

Motivation

◆Pattern of Attitude

- Professional Spirits
- Out of Revenge
- Spring of Passion
- Someones' Happiness

◆Motivation from Relaxing

- Step by Step
- Plan B
- Rhythm of Life
- Health Comes First
- ON/OFF
- Single-Mind

◆Motivation from Excitement

- After Pioneers
- In the Spotlight

◆Motivation from Impacient

- Look Around
- Design of Deadline (DoD)

The patterns of No.2-15 are about motivation. Inner motivation can advance the quality of research. But it is not easy for everyone to keep motivation.
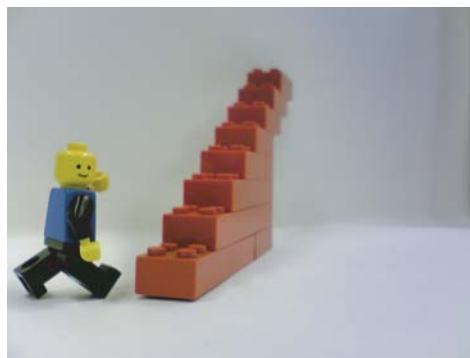
Spring of Passion

■ Situation and similar patterns

These are the patterns for situation that you don't have motivation, joy, or pride to your research (No.2-5).

◆Pattern of Attitude

Professional Spirits   Out of Revenge

Spring of Passion   Someones' Happiness

■ Problem

You can't love your research.

■ Solution

Recognize and utilize your motivation to make an environment which drives you to the research activity.

Where there is a will, there is a way.
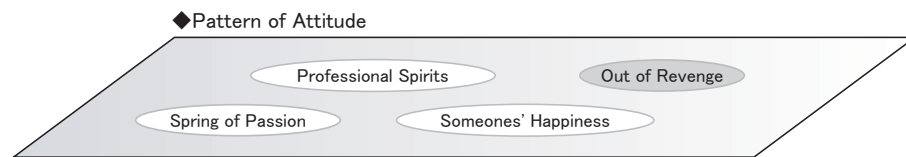
■ Keywords

motivation, drive

■ References

- Mogi (2007)

Research Pattern No.3

Out of Revenge

■ **Situation and similar patterns**

These are the patterns for situation that you don't have motivation, joy, or pride to your research (No.2-5).

◆Pattern of Attitude

Professional Spirits   Out of Revenge

Spring of Passion   Someones' Happiness

■ **Problem**

You can't love your research.

■ **Solution**

Remind the memories of deep impressions or regrets. They could be the energy to keep your motivation.

If life gives you a lemon, make a lemonade.
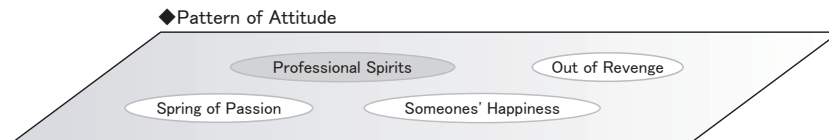
■ **Keywords**

motivation, drive

■ **References**

- Mogi (2006)

Professional Sprits

■ Situation and similar patterns

These are the patterns for situation that you don't have motivation, joy, or pride to your research (No.2-5).

◆Pattern of Attitude

Professional Spirits

Out of Revenge

Spring of Passion

Someones' Happiness

■ Problem

You can't love your research.

■ Solution

You feel sense of mission to your research, and it could be the driving force to work on your research actively.

The best augury of a man's success in his profession
is that he thinks it the finest in the world.
George Eliot(1819-1880)

■ Keywords
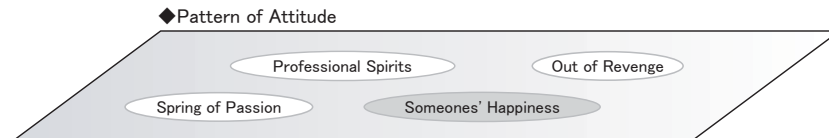
consciousness, motivation, drive

■ References

- Mogi (2007)
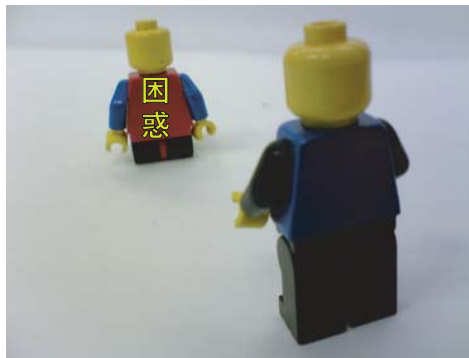- Bergin (2002)
- Arima (2000)

Someones' Happiness

■ Situation and similar patterns

These are the patterns for situation that you don't have motivation, joy, or pride to your research (No.2-5).

◆Pattern of Attitude

Professional Spirits　　　Out of Revenge

Spring of Passion　　　Someones' Happiness

■ Problem

You can't love your research. Your research can't be justified.

■ Solution

Your research may make someone smile. If you think that your research may be a big beneficial for someone, that will be the motivating force.

If you have nothing else to do, look about you and see
if there isn't something close at hand that you can improve.
It may make you wealthy, though it is more likely that it will make you happy.
George Matthew Adams

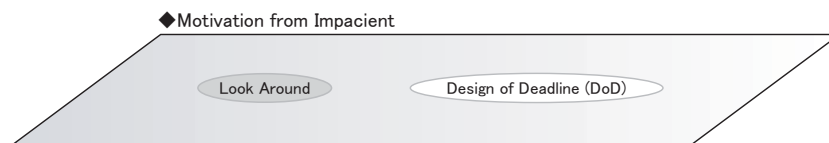### ■ Keywords

object, motivation, drive

■ References

- Mogi (2007)

Look Around

■ Situation and similar patterns

These are the patterns for the situation you feel lazy with your research activity (No.6-7).

■ Problem

You become conceited. You lost hungry to research, and procrastinate what you have to do.

■ Solution

Look at others' research activities, and get some stimulation. The others' attitude toward the research may encourage you.

Other men one lenses
through which we read our own minds.
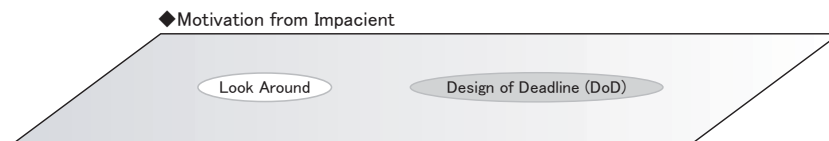
■ Keywords

other, motivation, tension

■ References

- Mogi (2006)

Design of Deadline (DoD)

■ **Situation and similar patterns**

These are the patterns for the situation you feel lazy with your research activity (No.6-7).

◆Motivation from Impacient

Look Around   Design of Deadline (DoD)

■ **Problem**

You become conceited. You lost hungry to research, and procrastinate what you have to do.

■ **Solution**

Compare the present situation with the ideal. Then you may notice what is missing, and then it becomes clear what you have to do.

Never put off till tomorrow what you can do today.

■ **Keywords**

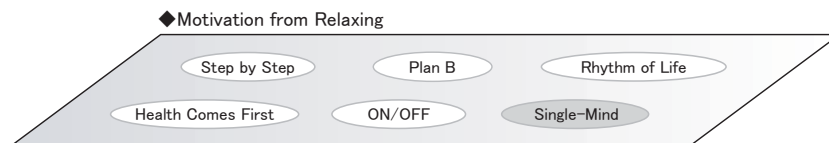restriction, deadline, society, output, motivation

■ **References**

- Mogi (2007)
- Endo (2006)

Single-Mind

■ Situation and similar patterns

These are the patterns for the situation when you feel frustrated, or having a dead end (No.8-13).

■ Problem

You can't be absorbed in your research because something disturbs you.

■ Solution

You should avoid the things that are not related to your research.

No man can do two things at once.

■ Keywords

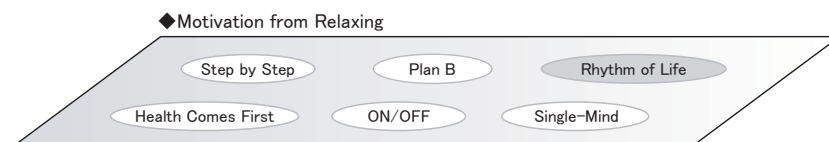concentration, restriction, motivation

■ References

- Bergin (2002)

Rhythm of Life

■ Situation and similar patterns

These are the patterns for the situation when you feel frustrated, or having a dead end (No.8-13).

■ Problem

You can't be absorbed in your research because something disturbs you.

■ Solution

Make some rules in your daily life. You make your own pace, and that makes time to concentrate on your research.

Early to bed and early to rise,
makes a man healty,wealthy and wise.
Benjamin Franklin(1706-1790)

■ Keywords

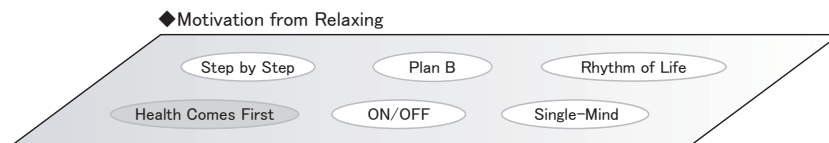routine, restriction, rule, daily life, motivation

■ References

- Hisaishi (2006)

Health Comes First

■ Situation and similar patterns

These are the patterns for the situation when you feel frustrated, or having a dead end (No.8-13).

◆Motivation from Relaxing

| Step by Step | Plan B | Rhythm of Life |
| Health Comes First | ON/OFF | Single-Mind |

■ Problem
You can't concentrate on your research. You want to, but you burn low.

■ Solution
You can't work on research without health. Be aware to your health, and you can concentrate on your research.

It is not until we lose our health
that we realize its value.

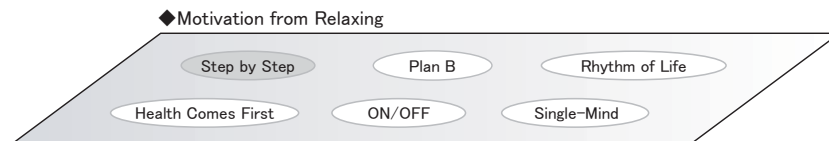### ■ Keywords
condition, health, daily life, motivation

■ References
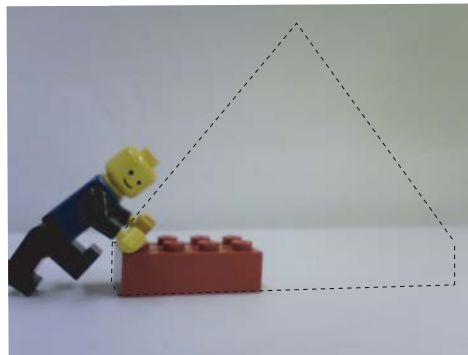- Mogi (2007)

Step by Step

■ Situation and similar patterns

These are the patterns for the situation when you feel frustrated, or having a dead end (No.8-13).

■ Problem

You can't concentrate on your research. Being too conscious to make a perfect result, and small mistakes suffers a setback.

■ Solution

There is no person who can make a perfect result for the first time. A journey of a thousand miles begins with a single step.

The longest journey begins with a single step.

■ Keywords

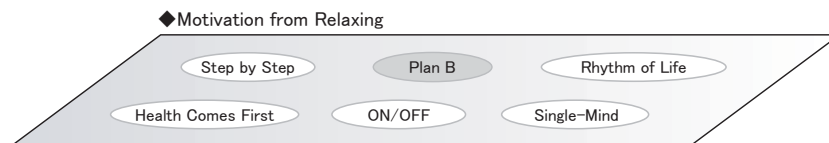consciousness, failure, small step, leeway, motivation
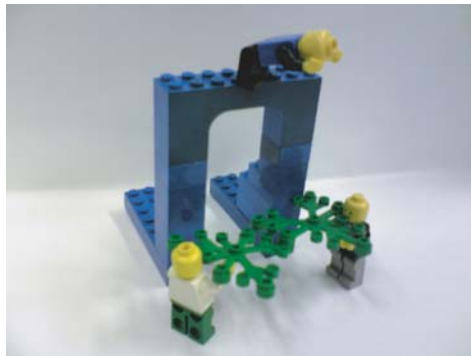
■ References

- Itami (2001)

Plan B

■ Situation and similar patterns

These are the patterns for the situation when you feel frustrated, or having a dead end (No.8-13).

■ Problem

You can't concentrate on your research. You lost energy when someone criticizes your research.

■ Solution

Every researcher hit the wall. You prepare the worst scenario in advance, and it would be the immunity.

Hope for the best and prepare for the worst.

■ Keywords
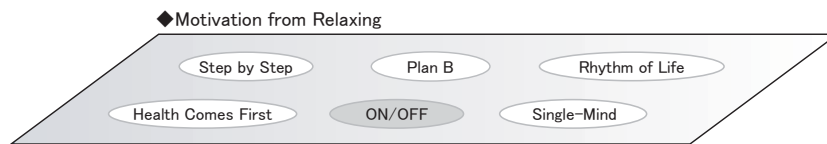
consciousness, plan, scenario, motivation

■ References

- Hatamura (2006)
- Mogi (2006)

ON/OFF

■ Situation and similar patterns

These are the patterns for the situation when you feel frustrated, or having a dead end (No.8-13).

◆Motivation from Relaxing

| Step by Step | Plan B | Rhythm of Life |
| Health Comes First | ON/OFF | Single-Mind |

■ Problem

You can't concentrate on your research. Both body and mind have a bad condition.

■ Solution

The important thing is to know how to relax yourself. If you find the way to fulfill yourself, you can work on your research continuously.

You must learn to be still in the midst of activity
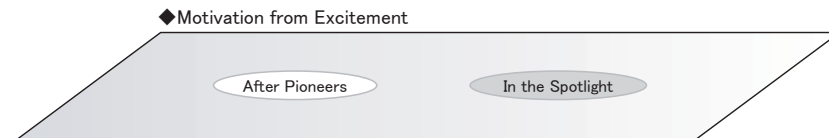*and to be vibrantly alive in repose.*

■ Keywords

relax, off, motivation

■ References

- Mizogami (2006)

Research Pattern No.14

In the Spotlight

■ **Situation and similar patterns**

These are the patterns that you have less motivation because you have no opportunity to get feedback from others (No.14-15).

■ **Problem**

You work on your research all alone, and nothing stimulates you.

■ **Solution**

The praise and criticisms make human grow up. It is important for your research to be known by others, like in academic conference.

> *I think one's feelings waste themeselves in words;*
> *they ought all to be distilled into actions which bring results.*
> *Florence Nightingale(1820-1910)*

■ **Keywords**

pride, other, excitement, result, output, motivation

■ **References**

- Nihonkagakushakaigi(1998)
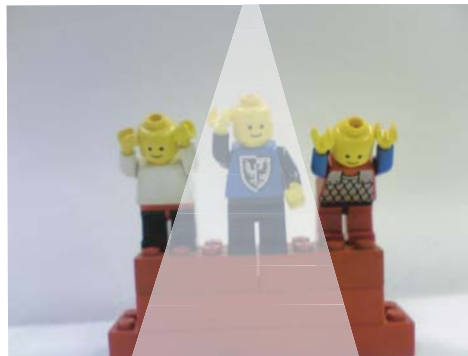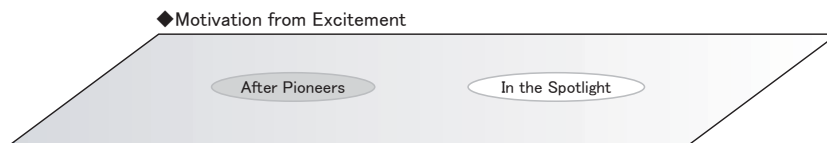
After Pioneers

■ Situation and similar patterns

These are the patterns that you have less motivation because you have no opportunity to get feedback from others (No.14-15).

■ Problem
You work on your research all alone, and nothing stimulates you.

■ Solution
See some professionals who are working on the latest research. You may get the fresh excitement.

True wisdom comes to each of us when we realize how little we understand about life, ourselves, and the world around us.
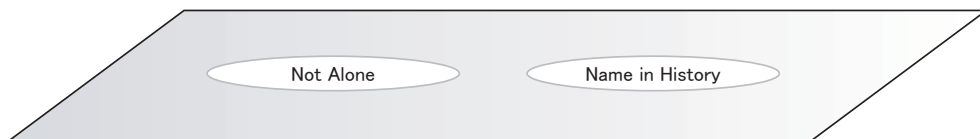
Socrates

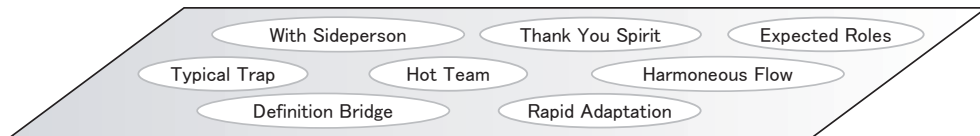### ■ Keywords
frontier, observation, consciousness, motivation

■ References
- Arima (2000)

Relationship

◆Pattern of Attitude

Not Alone

Name in History

◆ Relationship in Project

With Sideperson

Thank You Spirit

Expected Roles

Typical Trap

Hot Team

Harmoneous Flow

Definition Bridge

Rapid Adaptation

◆ Relationship in Society

Early Output

On the Stage

Target Client

Prototyping

For Future People
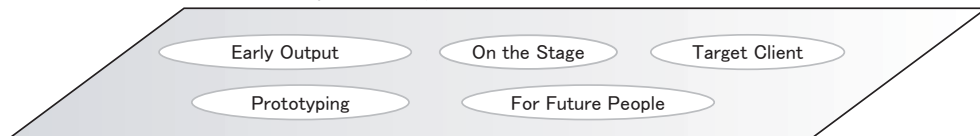
The patterns from No.16 to No.30 are about "relationship". Only one person can't research by himself. The "relationship" consists of two types. One is relationship with partners and member of project. Two is relationship in society such as conferences and publishing.

Research Pattern No.16

Not Alone

■ Situation and similar patterns

These are the patterns to switch the viewpoint of your research activity. (No.16and
25)

◆Pattern of Attitude

Not Alone   Name in History
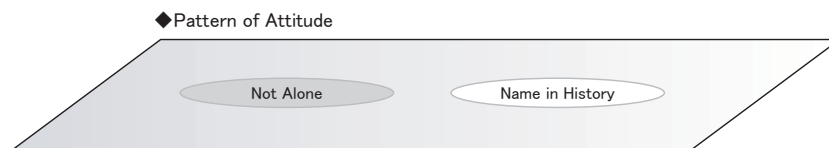
■ Problem

You can't take advantage of your environment because you think that research is a
solitary activity.

■ Solution

You can't do anything alone. The communications with others makes your research
more valuable.

Many hands make light work.

■ Keywords
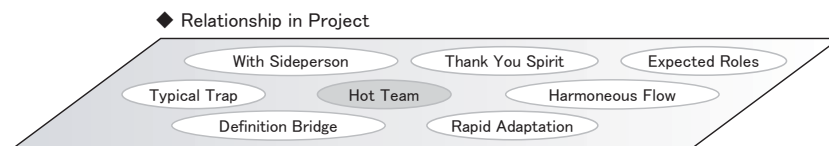
team, organization, relationship

■ References

- Mogi (2007)
- Nihonkagakushakaigi (1998)

Hot Team

■ Situation and similar patterns

These are the patterns for the situation that you work on your research by team. The relationship between team members is not hot (No.17-24).

◆ Relationship in Project

With Sideperson	Thank You Spirit	Expected Roles
Typical Trap	Hot Team	Harmoneous Flow
Definition Bridge	Rapid Adaptation

■ Problem

The relationship between team members is not hot.

■ Solution

To work on the research by team, the relation should be emotionally accessible. This connects to the pattern "Not Alone"(No.16).

Two heads are better than one.

■ Keywords

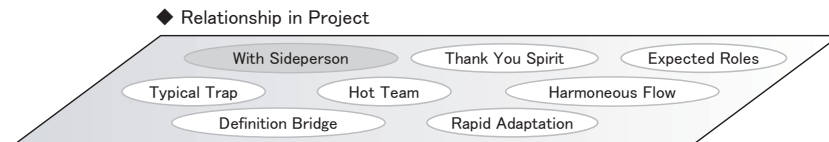team, alone, collaboration, communication, relationship

■ References

- Mogi (2006)
- Saeki (1995)

With Sideperson

■ Situation and similar patterns

These are the patterns for the situation that you work on your research by team (No.17-24).

◆ Relationship in Project

With Sideperson	Thank You Spirit	Expected Roles
Typical Trap	Hot Team	Harmoneous Flow
Definition Bridge	Rapid Adaptation	

■ Problem

You can't be objective to your research because you think your research is a solitary activity.

■ Solution

It is necessary to discuss the research with others. Sharing the idea with others prevent from the ego trip.

Education is the kindling of a flame,
not the filling of a vessel.

Socrates

■ Keywords

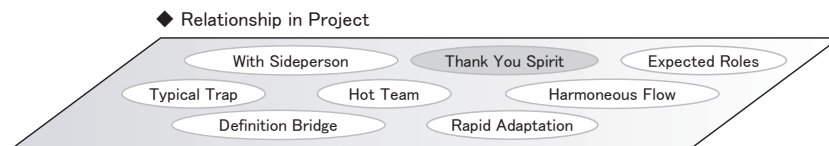alone, tension, motivation, collaboration, management, relationship

■ References

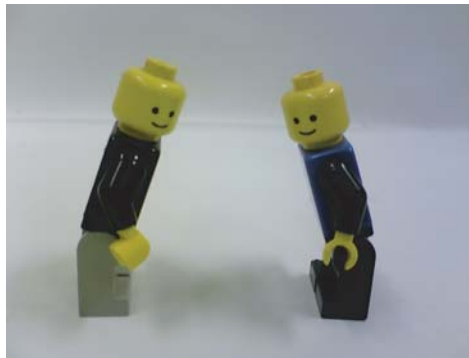- Mogi (2007)

Thank You Spirit

■ Situation and similar patterns

These are the patterns for the situation that you work on your research by team (No.17-24).

■ Problem

You don't help or thank to others, and others do the same. It is because that you think your research is a solitary activity.

■ Solution

Be humble and thankful to your team members. You can describe by words, or take a stance like " 'I've Finished!' is Halfway"(No.42) The good relationship makes research activity better.

Gratitude is the most exquisite form courtesy
Jacques Maritain (1882-1973)

■ Keywords

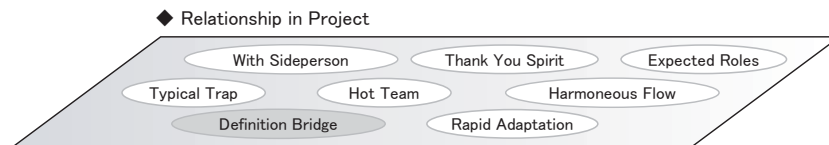thank, other, trust, confidence, relationship

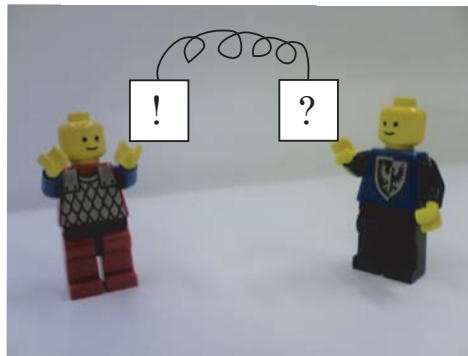### ■ References

- Gekkanbrane (2001)

Definition Bridge

■ Situation and similar patterns

These are the patterns for the situation that you work on your research by team. (No.17-24)

◆ Relationship in Project

With Sideperson   Thank You Spirit   Expected Roles

Typical Trap   Hot Team   Harmoneous Flow

Definition Bridge   Rapid Adaptation

■ Problem

You have difficulty to share the vision of the project, or the words used in daily life because each member has different backgrounds.

■ Solution

To make the smooth communication, share the concept and definition of the words you use. It is also needed to discuss each others' misconception.

We are what pretend to be,
so we must be careful about what we pretend to be.
Kurt Vonnegut

■ Keywords

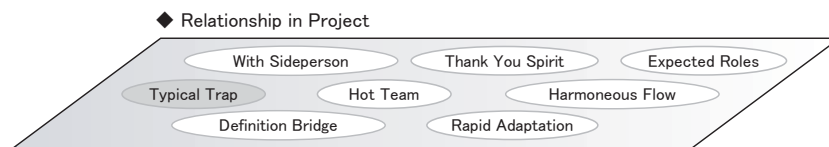a common language, collaboration, communication, relationship

■ References

- Saito(2007)
- Itami (2001)

Typical Trap

■ Situation and similar patterns

These are the patterns for the situation that you work on your research by team (No.17-24).

◆ Relationship in Project

With Sideperson   Thank You Spirit   Expected Roles

Typical Trap   Hot Team   Harmoneous Flow

Definition Bridge   Rapid Adaptation

■ Problem

The team member can't be confidential to you. Your faults make team members' relationship worse before you notice.

■ Solution

You can decide your direction to recognize the problems you tend to make.

One man's fault is another man's lesson

■ Keywords

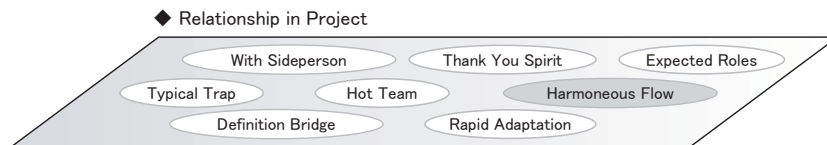fault, identity, communication, relationship

■ References

- Cohen and Cohen (2007)

Harmoneous Flow

■ Situation and similar patterns

These are the patterns for the situation that you work on your research by team. (No.17-24)

■ Problem

The communication is not smooth because there are some ambiguous problems, or the members don't know each others' situation.

■ Solution

You should take measures to prevent the negative affects to the research because of the relationship. Eliminating the discontent between the relationships connects to the "Hot Team"(No.16).

Afriend in need is a friend indeed.

■ Keywords

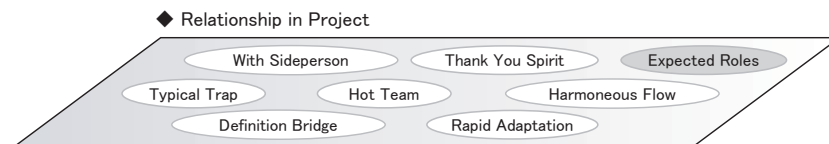team, organization, trust, confidence, communication, relationship

■ References

- Mima, Nakayama (2005)

Research Pattern No.23

Expected Roles

■ Situation and similar patterns

These are the patterns for the situation that you work on your research by team. (No.17-24)

◆ Relationship in Project

With Sideperson	Thank You Spirit	Expected Roles
Typical Trap	Hot Team	Harmoneous Flow
Definition Bridge	Rapid Adaptation	

■ Problem

You don't see your position in your laboratory, or what is expected to you.

Expectation

■ Solution

The communication with your team members and your professor makes clear your position and the expectations.

My expectations of other people,
I double them on myself.
James Brown

■ Keywords

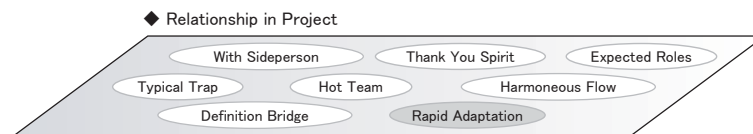team, organization, whereabouts, contribution, communication, relationship

■ References

- Cohen and Cohen (2007)
- Beynon(1998)

Rapid Adaptation

■ Situation and similar patterns

These are the patterns for the situation that you work on your research by team. (No.17-24)

◆ Relationship in Project

Typical Trap	With Sideperson	Thank You Spirit	Expected Roles
Definition Bridge	Hot Team	Harmoneous Flow
		Rapid Adaptation	

■ Problem
You don't know the rules in your laboratory.

■ Solution
The laboratory may have various rules or manners. The important thing is to understand these, and be careful not to make troubles.

When in Rome do as the Romanas do.

■ Keywords
organaization, rule, culture, communication, custom, relationship

■ References

- Kathy Barker (2005)
- Kelly and Littman (2002)

Name in History

■ Situation and similar patterns

These are the patterns that make you think that your research is a contribution to society (No.16and 25).

◆Pattern of Attitude

Not Alone   Name in History

■ Problem

You feel that your research does not contribute to society.

■ Solution

The research is not self-satisfaction. The research becomes to it when the society accepts. To make it, you can use "Early Output"(No.26). Also you can select "Target Client"(No.30), and find out how to be desired.

If you would not be forgotten as soon as you are dead and rotten,
either write things worth reading, or do things worth the writing.
Benjamin Franklin(1706-1790)

■ Keywords

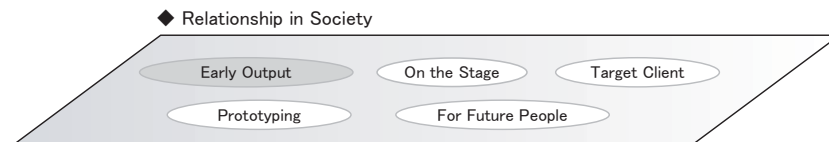outcome, output, society, fame, reputation

■ References

- Hayashi (2004)
- R.J. Beynon(1998)

Early Output

■ Situation and similar patterns

These are the patterns that make you think that your research is a contribution to society (No.26-30).

◆ Relationship in Society

Early Output   On the Stage   Target Client

Prototyping   For Future People

■ Problem

You feel that your research does not contribute to society. You present your research only in your community.

We get it!

■ Solution

It is necessary for the research to bring results. Get your research into shape by "Prototyping"(No.27), and you will get some feedbacks from others. It may be the chance to think about the direction of your research.

Doing business without advertising is like winking at a girl in the dark;
you know what you are doing,but nobody else does.
Edgar Watson Howe(1853-1937)

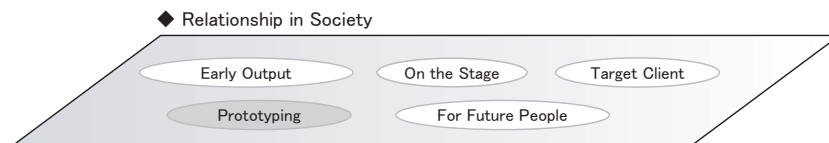## ■ Keywords

outcome, output, contribution, society

■ References

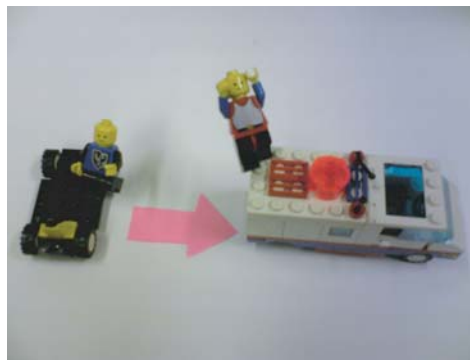- Arima (2000)

Prototyping

■ Situation and similar patterns

These are the patterns that make you think that your research is a contribution to society (No.26-30).

■ Problem

You feel that your research does not contribute to society. You can't get feedback from others because you don't make your research into shape.

■ Solution

Don't be insistent to the perfect result. Making rough cut is also important. It becomes the assurance of your research, and you may get feedback from others.

From small beginnings come great things.

■ Keywords

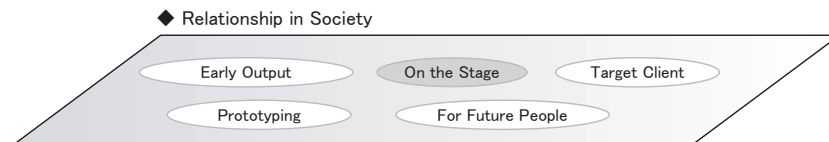prototype, demonstration, insurance, trial, outcome, output

■ References

- Arima (2000)
- Kelly and Littman (2002)

On the Stage

■ Situation and similar patterns

These are the patterns that make you think that your research is a contribution to society (No.26-30).

■ Problem

You feel that your research does not contribute to society. You feel anxious because you don't know who is accepting your research.

■ Solution

It is necessary to publish your paper in academic conference. The reason is in "Name in History"(No.25). For that, it is important to know the academic conference which you can join. Once you join academic conference, you may notice the position of your research.

Experience is the best of schoolmaster,
only the school-fees are heavy.

■ Keywords

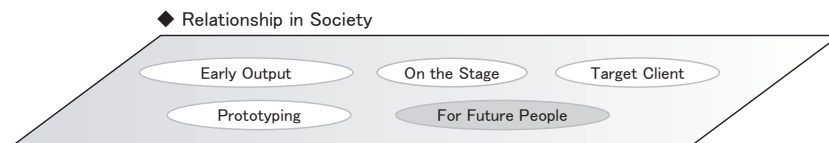outcome, output, conference, object, society
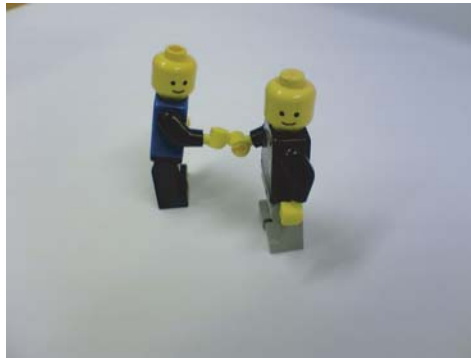
■ References

- Mogi (2006)

For Future People

■ Situation and similar patterns

These are the patterns that make you think that your research is a contribution to society (No.26-30).

◆ Relationship in Society

| Early Output | On the Stage | Target Client |
| Prototyping | For Future People |

■ Problem

You feel that your research does not contribute to society. You feel anxious because you don't know who is accepting your research.

■ Solution

Try to think your research objective. Is it desired by society? What the research intends? To clear that, "On-the-Spot Inspiration"(No.35) and "Target Client"(No.30) is usable.

Necessity is the mother of invention.

■ Keywords

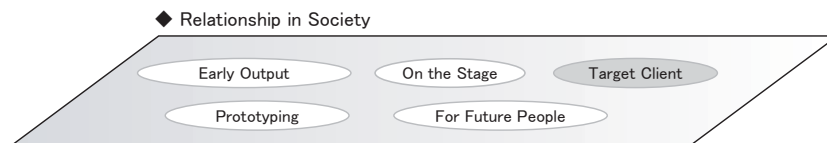needs, seeds, object, client, user, self-satisfaction

■ References

- Brane (2001)
- Mogi (2006)
- Itami (2001)

Research Pattern No.30

Target Client

■ **Situation and similar patterns**

These are the patterns that make you think that your research is a contribution to society (No.26-30).

◆ Relationship in Society

Early Output　　On the Stage　　Target Client

Prototyping　　For Future People

■ **Problem**

You don't completely figure out who this research is for.

■ **Solution**

Deciding the object person makes you research easier. "On-the-Spot Inspiration"(No.35) and "Trans-Walk"(No.36) may help you to find one object person.

If you want others to be happy, practice compassion.
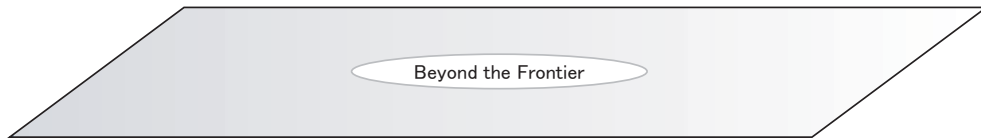*If you want to be happy, practice compassion.*
The 14th Dalai Lama

■ **Keywords**

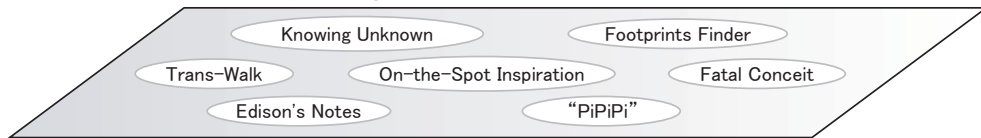object, needs, seeds, client, user, society

■ **References**

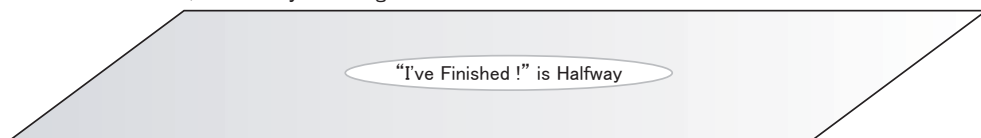- Mogi (2007)

Creativity

◆Pattern of Attitude

Beyond the Frontier

◆Creativity starting with Observation

Knowing Unknown

Footprints Finder

Trans-Walk

On-the-Spot Inspiration

Fatal Conceit

Edison's Notes

"PiPiPi"

◆Creativity flowering with Devotion

Catch the Flash

Why Why Why

Courage to Change

◆Creativity finishing with Conclusion
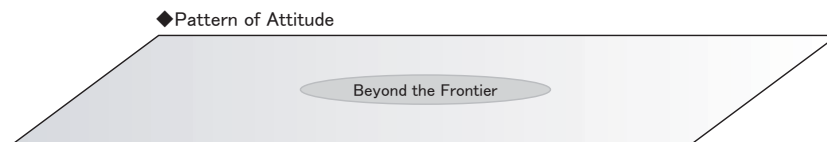
"I've Finished !" is Halfway

The patterns from No.32-No.42 are about the quality of research. Research activity is to open up a frontier.
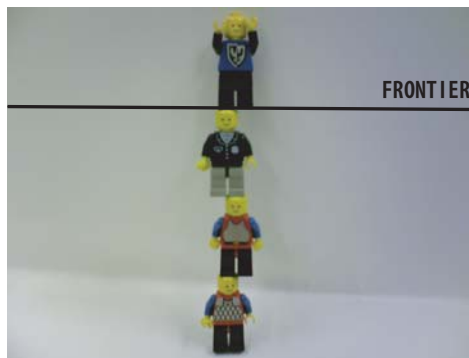
Beyond the Frontier

■ Situation and similar patterns

These are the patterns for that you begin your research, going over to it, or going back to basics.

■ Problem
There is no difference between the earlier study and your research.

■ Solution
The research is to pioneer the frontier of wisdom. To explore the originals in the discipline, the practice of "Footprints Finder"(No.37) is needed.

Do not go where the path may lead
instead go where there is no path and leave a trail.
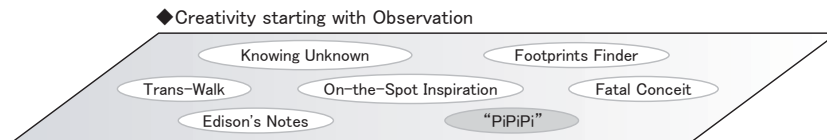*Ralph Waldo Emerson.*

■ Keywords
creativity, originality, novelty

■ References

- Mogi (2007)

Research Pattern No.32

"PiPiPi"

■ Situation and similar patterns

These are the patterns that when you collect the knowledge (No.32-38).

■ Problem

You are not ready for collecting the knowledge. You have no opportunity to get exciting knowledge, and you are not interested to new things.

■ Solution

Thinking by your self is important, but you notice many things only after getting some fresh knowledge. The important thing is to feel something. For that, you should practice "On-the-Spot Inspiration"(No.35) .

Learning is not attained by chance.
It must be sought for with ardor and attended to with diligence.

■ Keywords

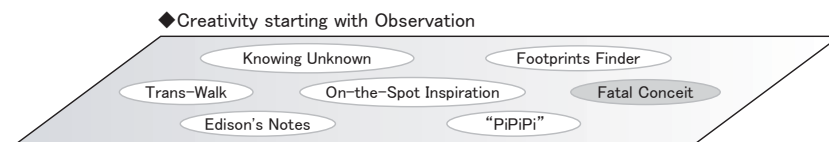creativity, antenna, sensitivity, consciousness, observation

■ References

- Hisaishi (2006)

<u>Fatal Conceit</u>

■ Situation and similar patterns

These are the patterns that when you collect the knowledge (No.32-38).

◆Creativity starting with Observation

Knowing Unknown　　　Footprints Finder

Trans-Walk　　On-the-Spot Inspiration　　Fatal Conceit

Edison's Notes　　　"PiPiPi"

■ Problem

You are not ready for collecting the knowledge. You get satisfied with small amount of information.

■ Solution

It is crucial to get fresh information for your research. Be greedy to get more knowledge, and your research will be profound.

Nothing seek, nothing find.

■ Keywords
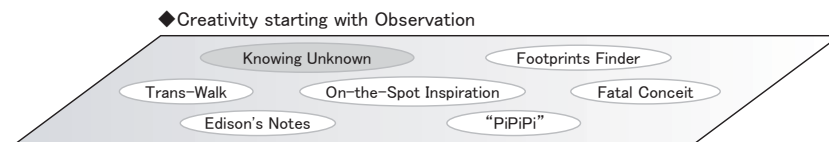
creativity, observation, antenna

■ References

- Mogi (2006)

Knowing Unknown

■ Situation and similar patterns

These are the patterns that when you collect the knowledge (No.32-38).

◆Creativity starting with Observation

Knowing Unknown Footprints Finder
Trans-Walk On-the-Spot Inspiration Fatal Conceit
Edison's Notes "PiPiPi"

■ Problem

You are not ready for collecting the knowledge. You investigate only what you want to know, and stay away from difficulty.

■ Solution

Once you make a hypothesis, you tend to keep eyes on certain stuff in order to verify it. Try to be open minded, accept everything you don't understand or unexpectedness. It is recommended to use "On-the-Spot Inspiration"(No.35) or "Trans-walk"(No.36) with same time.

He that nothing questions nothing learns.

■ Keywords

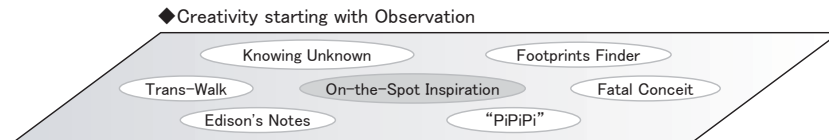creativity, observation, question

■ References

- Brane (2001)
- Bergin (2002)
- Itami (2001)

On-the-Spot Inspirarion

■ Situation and similar patterns

These are the patterns that when you collect the knowledge (No.32-38).

◆Creativity starting with Observation

Knowing Unknown	Footprints Finder
Trans-Walk	On-the-Spot Inspiration	Fatal Conceit
Edison's Notes	"PiPiPi"

■ Problem

You are not ready for collecting the knowledge. You work on your research indoors. You never see the field, and what you make is impractical proposition.

■ Solution

Let's go outdoors. If you watch the field, you will get a hint which cannot be getted in the theory. Don't forget to use "Fatal Conceit"(No.33) and "Knowing Unknown"(No.34).

You can't learn to swim by reading books about it.

■ Keywords

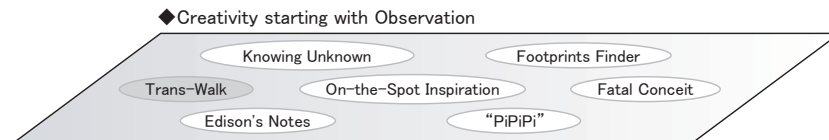creativity, observation, on-the-spot, feeling, motivation

■ References

- Mogi (2006)
- Hayashi (2004)

Trans-Walk

■ Situation and similar patterns

These are the patterns that when you collect the knowledge (No.32-38).

◆Creativity starting with Observation

Knowing Unknown   Footprints Finder
Trans-Walk   On-the-Spot Inspiration   Fatal Conceit
Edison's Notes   "PiPiPi"

■ Problem

You are not ready for collecting the knowledge. You have no opportunity to get exciting knowledge, and you don't come up with fascinating ideas.

■ Solution

Join other area of research. You may think you don't belong to that, but it is also a big finding. It is almost impossible to choose the best discipline to you. Remember the pattern "Fatal Conceit"(No.33) and "Knowing Unknown"(No.34).

Easier said than done.

■ Keywords

creativity, observation, antenna, activity

■ References

- Brane (2001)
- Itami (2001)

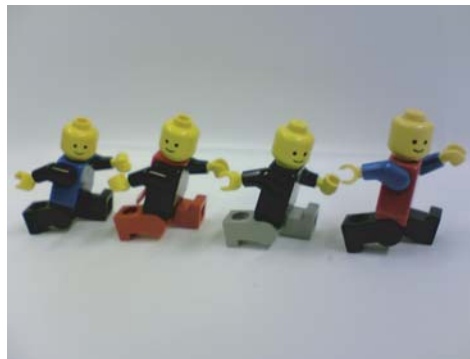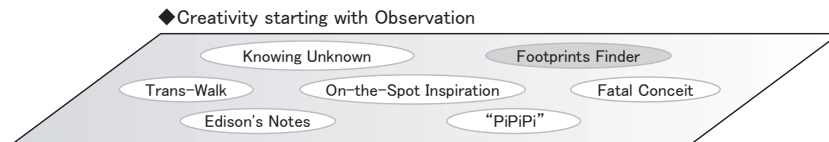Research Pattern No.37

Footprints Finder

■ Situation and similar patterns

These are the patterns that when you collect the knowledge (No.32-38).

■ Problem

You are not ready for collecting the knowledge. You can't figure out your position because you know nothing about the discipline. Moreover, it is not the research that can utilize your originality.

■ Solution

It is important to know what have done, and what can you do in that discipline. Also, you must know the frontier in order to pioneer the unknown world. Read related books and papers as many as you can, and think about the originality. "Beyond the Frontier"(No.31) is very important to know.

I checked all the registered historical facts,
and I was shocked into shame to discover.
"The Smiths" The Queen is Dead.

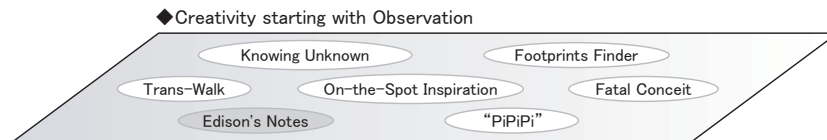### ■ Keywords

existent study, literature, novelty

■ References

- Brane (2001)
- Barker (2005)

Edison's Notes

■ Situation and similar patterns

These are the patterns that when you collect the knowledge (No.32-38).

◆Creativity starting with Observation

Knowing Unknown　　Footprints Finder

Trans-Walk　　On-the-Spot Inspiration　　Fatal Conceit

Edison's Notes　　"PiPiPi"

■ Problem

You are not ready for collecting the knowledge. You have come up with some ideas or gained helpful information, but you forget to keep these.

■ Solution

Thomas Edison left over five million page of document. Like Edison, write down all the information you received. Things that made you wonder, interested, will be a basic to your research.

All new inventions I will here after keep a full record.
　　　　　　　　Thomas Alva Edison　　(1847-1931)

■ Keywords

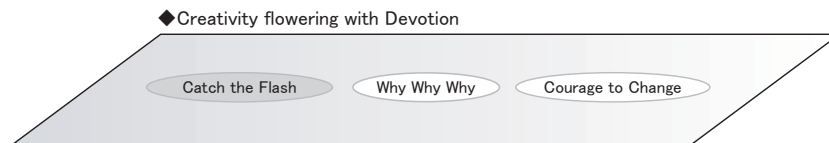creativity, observation, antenna, memo , note , memory

■ References

- Beynon(1998)

Catch the Flash

■ Situation and similar patterns

This is the pattern for situation that you dropped into deep thought (No.39-No.41).

■ Problem

You make slow progress to make speculation, or an idea.

■ Solution

To come up with an idea, the process and the reasons are needed. Try to practice the pattern "Trans-Walk"(No.36) and "*PiPiPi*"(No.32).

March winds and April showers bring May flowers.

■ Keywords

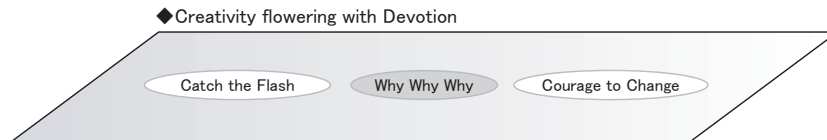creativity, idea, flash, preparation

■ References

- Hisaishi (2006)
- Brane (2001)

Why Why Why

■ Situation and similar patterns

This is the pattern for situation that you dropped into deep thought. (No.39-No.41)

◆Creativity flowering with Devotion

Catch the Flash   Why Why Why   Courage to Change

■ Problem

You have difficulty to get the whole picture, or the direction of your research.

■ Solution

Try to make a simple aim. To straighten your thinking, you can schematize or explain to someone.

Learn from yesterday,live for today,hope for tomorrow.
The important thing is not to stop questioning.
Albert Einstein

■ Keywords

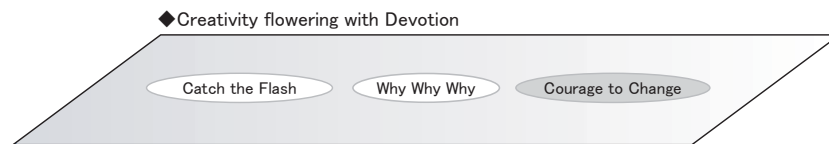creativity, nature, key, stem, question

■ References

- Mogi (2007)

Courage to Change

■ Situation and similar patterns

This is the pattern for situation that you dropped into deep thought (No.39-No.41).

◆Creativity flowering with Devotion

Catch the Flash   Why Why Why   Courage to Change

■ Problem

You feel awkward to change your direction of your research.

■ Solution

To evolve is to change. To make your research better, you should be broad-minded to the change. Be pliability to the direction of the research.

It is never too late to mend.
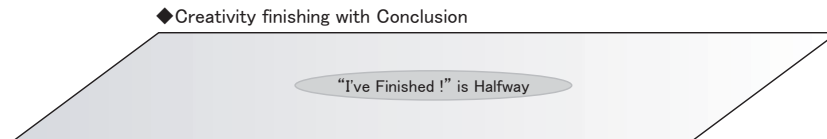
■ Keywords

fork, change, chance

■ References
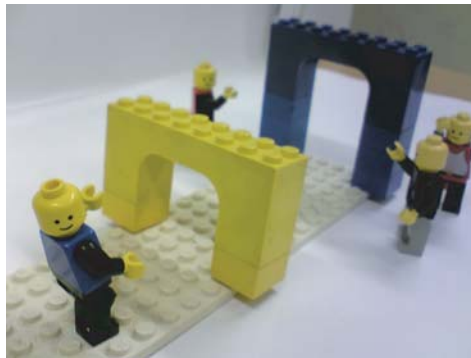
- Mogi (2006)
- Hisaishi (2006)

"I've Finished !" is Halfway

■ **Situation and similar patterns**

This is the pattern for the situation that you are producing results.

◆Creativity finishing with Conclusion

"I've Finished !" is Halfway

■ **Problem**

When you are about to get to the ending part, you tend to work on without review the progress.

■ **Solution**

Don't forget to tie up the loose ends. What you think the accomplishment may not be the perfect shape. Try to work on "Why Why Why" (No.40). It will be the element of "Thank You Split"(No.19), and the good way of "Prototyping"(No.27).

The end crouws all.

■ **Keywords**

carelessness, end, final, self-check, impatient, halfway

■ **References**

- Mogi (2006)

Research Pattern No.43

Never Ending Study

■ **Situation**

This is the pattern for the situation that you are ending your research.

■ **Problem**

You back out of your research as soon as you have finished.

■ **Solution**

Wring the paper is not the accomplishment. The research starts from the paper. If you are going to master's or doctor's course, all the more this stage is a start line of you.

The world os round and place which may seem like the end
may also be the beginning.

Ivy Baker Priest(1905-1975)

■ **Keywords**

ending, start, motivation

■ **References**

- Bergin (2002)
- Mogi (2006)

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19) Tom Kelley and Jonathan Littman, *The Ten Faces Of Innovation: IDEO's Strategies for Defeating the Devil's Advocate and Driving Creativity Throughout Your Organization*, Currency, 2005