Learning Patterns III

A Pattern Language for Creative Learning

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ABSTRACT

In this paper we present a pattern language for creative learning, which we named "Learning Patterns." The Learning Patterns consists of 40 patterns describing practical knowledge for problem finding and problem solving in learning are presented. It provides an opportunity for learners to know ways that they have not experienced, but that are known as good ways, and also it encourages learners to talk about their ways for learning in their group or community. In this paper, we show the following ten patterns from the Learning Patterns: Design Your Learning, Making Opportunities, Creative Project, Open-Process Learning, Embodied Skills, Language Shower, Tangible Piles, Thinking in Action, Prototyping, and Field Diving. Note that other patterns have been presented in *PLoP2009* and *AsianPLoP2010*.

Categories and Subject Descriptors

D.2.10 [**Software Engineering**]: Design—*Methodologies*

General Terms

Design, Human Factors, Management

Keywords

pattern language, learning, education, creativity

1. INTRODUCTION

In recent complex society, it is essential to find problems and think of solutions from various points of view with a creative mind. People need to learn by constructing their own living knowledge based on their situation, not just by memorizing existing ideas. It is also necessary to learn how to get new ideas and how to think. Learning in that sense is of primary importance today, however few opportunities and tools to help learning how to learn. Set against this backdrop, we proposed Learning Patterns, which is a pattern language [2, 1] to share 'knacks' for the way of creative learning, in the previous papers [8, 7, 6]. Since we have improved the form

and contents, we would like to show the latest version of Learning Patterns in the new form.

2. BACKGROUND

The Learning patterns were developed in the Learning Patterns Project, Keio University [6]. We have handed out a catalog booklet of learning patterns to undergraduate students (Figure 1). The catalog has been handed out to approximately 5,000 students of two faculties: Faculty of Policy Management and Faculty of Environment and Information Studies. These faculties have implemented a unique curriculum that is interdisciplinary and non-graded. It means all undergraduate students can study any kind of academic areas, for example social innovation, public policy, global strategy, environment, life sciences, and information studies, without reference to their grades and experience. Therefore the students should design their own learning, and it is the reason why we made the learning pattern for supporting learning design.

As it is well known in the scenes of education, there is a difficult problem how one can teach how to learn. While it is quite easy to show the guideline to follow, it may shut learners out of the chance for thinking their own way of learning themselves. Furthermore, there is another difficulty to provide appropriate guideline for all learners who are under various situations. So, is it possible to provide something to help the learners under various situations to design their way of learning?

In this context, we think that a pattern language is good way to help the student to design their learning, because it focuses on providing a new view for the learner so that they can reflect. It is quite important that the method is not easy way to get the result without thinking themselves. It is not, however, irresponsible way to leave all up to individual ability. It is considered as the way that tolerates individual ability while making a good use of abstract rules of past experience.

Although Learning patterns were originally developed in order to support university students, we think it can be applied to any learners in various situations like engineering, business, science, and everyday life due to their fine abstract descriptions as a pattern language. We anticipate that the patterns will become a good tool for sharing the way of thinking for all learners.
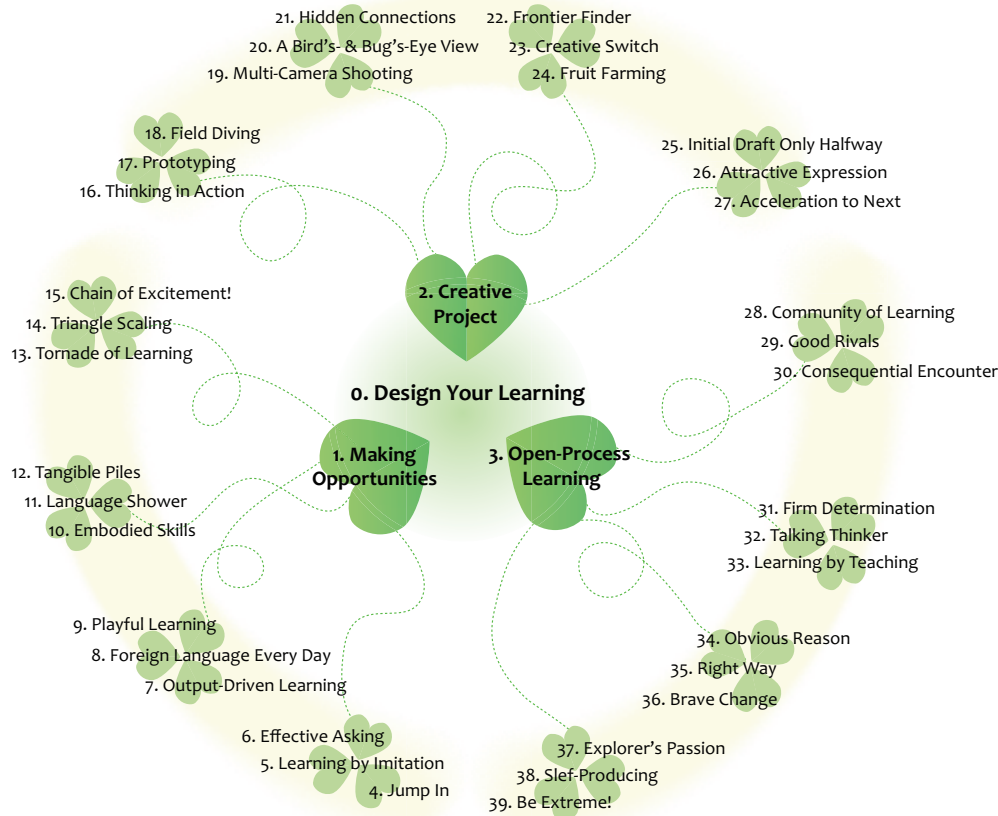
Figure 1: Whole Structure of the Learning Patterns

3. WHOLE STRUCTURE OF THE LEARNING PATTERNS

The Learning Patterns consist of 40 patterns. Figure 1 shows the overview of the whole structure of the Learning Patterns. The Learning patterns are organized in three layers according to the abstraction level. In the top layer, there is a root pattern: Design Your Learning (No.0). This pattern provides an introductory explanation about why and how to use the Learning Patterns. Such an explanation is usually provided outside the pattern language, however we put it in the pattern language as a self-referential pattern. In the second layer, there are three fundamental patterns: Making Opportunities (No.1), Creative Project (No.2) and Open-Process Learning (No.3). These patterns show essential minds for creative learning, summarizing more specific patterns in next third layer. In the third layer, there are thirty-six patterns as concrete 'knack' of learning: Jump in (No.4), Learning by Imitation (No.5), Effective Asking (No.6), and so on.

4. PATTERN FORM OF THE LEARNING PATTERNS

Learning Patterns consist of 40 patterns, where each pattern is written in the same form: Pattern Name is the attractive and memorable words that can be used as a building block for thinking and a vocabulary for communication about the way of learning; Introductory Sentences and Illustration are introductory parts that impress the meaning of this pattern lively; Quotations rephrase the essence of this pattern with notable sayings; Context is the condition for applying this pattern; Problem describes a difficulty that often occurred in the context but is not easy to overcome; Forces are unavoidable laws that make the problem hard to solve; Solution describes the way to solve the problem, which is written in an abstract way; and Actions offer concrete approaches to put the solution into practice.

In the catalog of the Learning Patterns, each pattern is printed in a double page spread, as shown in Figure 2. In the first half of pattern, which is printed at the left page in the catalog, the overview of the pattern is described: Pattern Name, Introductory Sentences and Illustration, and Quotations. In the last half of pattern, which is printed at the right page in the catalog, the details of the pattern are described: Context, Problem, Force, Solution, and Actions.

5. WORKSHOP WITH THE LEARNING PATTERNS

Holding a workshop with using the Learning Patterns provides a good opportunity to encourage learners to talk about their ways for learning in their community [4, 5, 3]. The
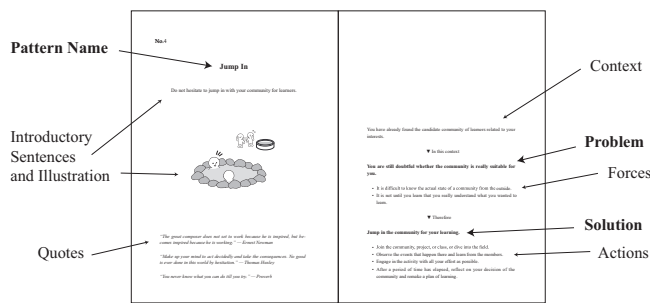
Figure 2: Page Layout of the catalog of the Learning Patterns

Figure 3: Experience Mining and Dialogues Workshop with the Learning Patterns (1)

Figure 4: Experience Mining and Dialogues Workshop with the Learning Patterns (2)

workshop, which is entitled "Experience Mining and Dialogues Workshop with the Learning Patterns" (Figure 3, 4), is designed for that participants talk about their experience of learning in the light of patterns. First of all, participants make a list of patterns that they have experienced, and choose 5 patterns that they want to gain in the near future. Then, the participants look for the person who has experienced the learning patterns they want to gain, and listen to the experience of the learning.

Through the workshop, participants acquire a new vocabulary and deeper understanding of the patterns. Furthermore, the workshop provides shared experience in using the pattern language in their community, and thus the participants become to have no hesitation in talking their experience and knowledge in their community. Whenever we hold the workshop explained above several times, we are surprised at the excitement of participants. Based on our observation and survey, the pattern language was used as a medium for reflecting learners' experience, and the workshop provides a good opportunity to understand the meaning of each pattern and to talk about how to learn with other learners.

6. PATTERNS PRESENTED IN THIS PAPER

Here we present ten patterns from Learning Patterns (Figure 4): Design Your Learning (No.0), Making Opportunities (No.

1), Creative Project (No.2), Open-Process Learning (No.3), Embodied Skills (No.10), Language Shower (No.11), Tangible Piles (No.12), Thinking in Action (No.16), Prototyping (No.17), and Field Diving (No.18).

Design Your Learning

The Learning Patterns help you improve your way of learning, and help you build an active community of learners.
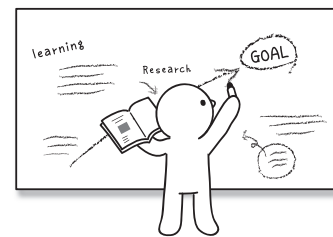
"Design is not just what it looks like and feels like. Design is how it works." — Steve Jobs
"The limits of my language mean the limits of my world." — Ludwig Wittgenstein
"It is not knowledge, but the means of gaining knowledge which I have to teach." — Thomas Arnold

* * *

You've recognized that continual learning is an essential activity in a complex and fluid society.

▼ In this context

It is not easy to learn how to learn.

- There are several ways of learning.

- It is unrealistic to try many ways of learning because time is limited.

- It is quite difficult even for experts to explain their tacit knowledge.

▼ Therefore

Learn the way of learning from the Learning Patterns, which help you achieve good methods for learning.

- Read through all patterns to understand what the Learning Patterns are like, especially the first half of each pattern, namely a pattern name, an introductory sentence and illustration, and quotes.

- Read the detail of each pattern in which you are interested. In the second half of each pattern, there are descriptions about a context, a problem, forces (difficulties why the problem is hard to solve), a solution, and actions (how to solve problems in practice).

- Read the patterns in order to recognize the problem that may easily occur in the context where you are.

- When you face a problem in learning, find the corresponding patterns to find the solution to it.

- When you talk about the way of learning, use the pattern name of the Learning Patterns as the term of a common language for learning.

Making Opportunities

Opportunities for learning are created,
not something that you chance upon or wait for.

"A wise man will make more opportunities than he finds."
— Francis Bacon
"In the fields of observation chance favors only the prepared mind." — Louis Pasteur
"Action is the foundational key to all success." — Pablo Picasso

* * *

You are ready to learn, perhaps having some expectations for opportunities for learning.

▼ In this context

There are few good opportunities for learning compared with your expectations.

- Given opportunities are not always suitable for you.

- It is not easy to notice what is not there.

▼ Therefore

Make opportunities for learning by yourself, based on your interests.

- Consider your interests, and specify the knowledge and skills that you want / need to learn.

- Seek the information related to your needs, and explore the way of learning.

- Set yourself in the environment to start learning, for example taking a course, joining the project, or buying the books.

Creative Project

Learn through actively creating,
rather than through rote memorization.

"Acquiring is always secondary, and instrumental to the act of inquiring" — John Dewey
"The true delight is in the finding out rather than in the knowing." — Isaac Asimov
"All the world is a laboratory to the inquiring mind." — Martin H. Fischer

* * *

You have started to learn, and you want more intellectual excitement.

<div align="center">▼ In this context</div>

Maybe you are unwilling to learn just by acquiring knowledge and skills.

- It is difficult to work on what you are not interested in.
- It tends to be boring to read or listen to what is one-way.

<div align="center">▼ Therefore</div>

Launch your project or join a project, and carry it out to improve your knowledge and skills.

- Grasp the up-to-date knowledge and think about what you want / need.
- Improve your knowledge and skills through creating projects and fieldwork for new discoveries.
- Make a reflection of what you have learned.
- Then, think about a better way for learning.

Open-Process Learning

*Open up your learning process
to others for your future.*
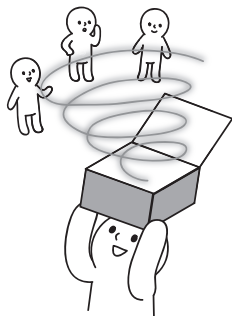
"Dialogue is really aimed at going into the whole thought process and changing the way the thought process occurs collectively." — David Bohm

<div align="center">* * *</div>

You have already learned to some extent, and you want to deepen your learning.

<div align="center">▼ In this context</div>

Learning tends to be closed. It is difficult to deepen your understanding only by yourself.

- Knowledge a person has is limited.
- It is difficult to notice your lack of understanding.
- There is little opportunity for meeting people who share similar interests with you.

<div align="center">▼ Therefore</div>

Share your learning process and collaborate with others to deepen your and others' learning.

- Make friends or rivals who will work with you.
- Share your results at the present stage and get some feedback before you finish it.
- After collaborating with others, persevere with utmost effort.

Embodied Skills

*Continue practicing until you acquire
the desired skills.*

"Practice makes perfect." — Proverb

<div align="center">* * *</div>

You want to acquire a skill.

<div align="center">▼ In this context</div>

It is not enough to memorize the "how to."

- Learning from experience is easier to remember than rote memorization.

- Skills can be used unconsciously.

- It is hard to verbalize a skill that has been acquired through experience.

▼ Therefore

Continue practicing a skill again and again until you can use it unconsciously.

- First of all, try to use new skill and acquire a sense of it.
- And then, study the skill and understand how it works.
- Finally, keep in practice until you master it. Leaving the trace of learning as Tangible Piles (No.12) is a good way to maintain your motivation.

Language Shower

Submerge yourself in the environment where you inevitably have exposure to the language you want to master.

"There is no way to stop sound and have sound." — Walter J. Ong

* * *

You want to be good at listening and reading in a language.

▼ In this context

To master languages is tough.

- The sense of a language is much affected by the nature and culture where it is used.

- The stock of expressions enables you to convey what you want to say.

- It takes a long time to master a language.

▼ Therefore

Set up your environment where you always listen and read in the target language.

- If you want to master a foreign language, set up your environment, for example, using mobile media, and to continue listening to and reading it.

- Then, make rules to use the language every day, for example, just listen to an online radio broadcast or audio book in the background. Making a physical record of your learning activities as Tangible Piles (No.12) is a good way to maintain your motivation.

Tangible Piles

Your growth isn't built in a day.

"All of us every single year, we're a different person. I don't think we're the same person all our lives." — Steven Spielberg

* * *

You need to continue practicing for acquiring Embodied Skills (No.10) or taking Language Shower (No.11).

▼ In this context

It is not easy to keep yourself motivated to learn.

- It takes a long time before you realize the effect of learning.

- It is difficult to maintain your motivation for what you need to work hard.

<p align="center">▼ Therefore</p>

Record the activities of your learning for reinforcement and reflect on your track record.

- Underline passages and write notes when reading books, set out the books and papers you've read, or hang your own works on the wall.
- Sometimes, look back the track of your learning to realize the growth of knowledge and skills.

Thinking in Action

*Creating prototypes or diving into fields
deepens your thinking.*
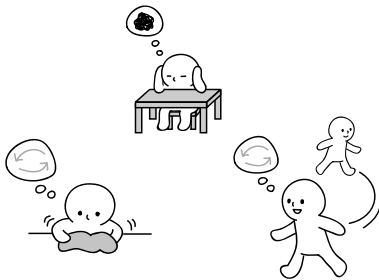
*"The way to get started is to quit talking and begin doing."
— Walt Disney*
"The only source of knowledge is experience." — Albert Einstein

<p align="center">* * *</p>

You have been studying by reading books, articles, or other written materials.

<p align="center">▼ In this context</p>

It is difficult to get out of the situation when you are stuck.

- It is not easy to change your understanding without interaction between you and your environment.
- It is difficult to foresee all of possible challenges before carrying out your plan.

- Creation and practice make you aware of your limitations.

<p align="center">▼ Therefore</p>

Deepen your thought process by making prototypes and doing fieldwork.

- Making prototypes with easily manipulated medium by Prototyping (No.17), and you will improve your ideas and gain new insight.
- Acquire knowledge from doing fieldwork by Field Diving (No.18), and the knowledge will help you to deepen your thoughts.

Prototyping

*It is not until you make some prototypes
that you figure out what you really want to make.*

"My hand is the extension of the thinking process - the creative process." — Tadao Ando
"A picture is worth a thousand words. ... a good prototype is worth a thousand pictures." — T. Kelly
"Without craftsmanship, inspiration is a mere reed shaken in the wind" — Johannes Brahms

<p align="center">* * *</p>

You have an idea and are almost ready to implement it.

<p align="center">▼ In this context</p>

You cannot clarify an image of what you will create.

- It is not until you take actions towards the objective that you find it clearly.
- Making things opens up the possibility of your next stage of learning.
- It is difficult to discuss an idea without a concrete image of it.

Make some prototypes and consider how to make it better.

- Make a prototype and find out what doesn ' t work.

- Consider other approaches to your problems and make the prototype again.

- Using the prototypes, share your ideas with others and make better prototypes than before.

Field Diving

It's not until diving into the field
that you touch upon reality.
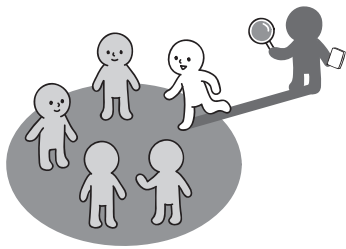
"A desk is a dangerous place from which to watch the world."
— John Le Carré
"Experience without theory is blind, but theory without experience is mere intellectual play." — Immanuel Kant
"The map is not the territory" — Alfred Korzybski

* * *

You are thinking about and have an interest in an actual problem.

▼ In this context

You cannot touch upon reality only by referring to documents.

- Description about a subject is not the subject itself.

- There exists knowledge on the spot in the field.

- There is something that is certain or clear for some people but not for others.

- The deeper you are in the field, the more you lose an objective point of view because you are inevitably affected.

▼ Therefore

Dive into the field and work with the people concerned while maintaining the viewpoint of an outsider.

- Search for a field that you are interested in.

- Dive into the field, and observe what is going on there.

- Understand the context and intention of the activities, while interacting with the people concerned.

- Deepen your understanding of the reality by reconsidering your experiences from a certain point of view.

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