

Pedagogical Patterns for Creative Learning

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ABSTRACT

In this paper we propose a pattern language for designing and facilitating creative learning, which is a style of learning with activities creating something. This style, creative learning, involves the project-based environment with the problem- and conflict-solving, emerging of ideas with synthesizing and analyzing discussion repeatedly, and expressing the product of ideas in many kinds of media. Despite the importance of creative learning, methods for designing curriculum and facilitating the class for creative learning are still unknown. Also, there are no road map to train teachers as designers and facilitator for the learning style. Here we present three patterns for designing and facilitating creative learning: Discovery-Driven Expanding, Challenging Mission, and Generative Participant. These patterns are intended to constitute a part of the whole language, which will be presented in the succeeding papers. These patterns are written for teachers, curriculum designers, and administrators of school, from elementary school to university, and we believe that this language can help them to realize creative learning.

Categories and Subject Descriptors

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

General Terms

Design, Human Factors, Management

Keywords

pattern language, learning, education, creativity, collaboration

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1. INTRODUCTION

A century ago, John Dewey presented a conception of education, focusing on inquiring process. In his book *Democracy and Education*, he said "Acquiring is always secondary, and instrumental to the act of inquiring" [4]. In this conception, inquiry process is the very thing of thinking process, and deep understanding is possible only by accumulating experiences of inquiring activities.

In today's society, which is sometimes called knowledge society [5] or creative society [9], the ability to create knowledge is getting to be important rather than the ability to memorize the existing ideas. This kind of ability cannot be acquired with conventional education like mere transference of existing ideas and techniques, from teachers to students. Thus a new paradigm is required; we believe that it is creative learning [7]. In our perspective, creative learning can be considered as third stage, which we call "Learning 3.0," after conventional learning by knowledge transfer and learning by communication (Figure 1). The every style of learning can adjust not only to the classroom, but also to our daily life.

Creative learning is a style of "Learning by Doing" [2] with creation. Creation, in the theory proposed by one of the author of this paper, means the successive emergence of discoveries [6]. In this sense, creative learning is more than learning by experience, and it requires successive emergence of discoveries. Therefore, to realize effective creative learning, teachers need to design a good mission for creation. Without any mission, successive emergence of discoveries hardly occurs, and as a result the learners hardly change their recognition.

Despite the importance of creative learning, methods for designing curriculum and facilitating the class for creative learning are still unknown. Also, there are no road map to train teachers as designers and facilitator for creative learning. Set against this backdrop, in this paper, we propose a new language for designing the curriculum, mission, and class of creative learning.

	Focus	Style	Guide
Learning 3.0 <i>Creative Learning</i>	Creative (discovery) 	Creative Project 	Generative Participant
Learning 2.0	Social (communication) 	Workshop 	Facilitator
Learning 1.0	Individual (thinking) 	Subject Study 	Teacher

Figure 1: Three waves of learning style

2. OVERVIEW OF THE LANGUAGE

The pedagogical patterns for creative learning, presented in this paper, contains three patterns. These patterns are written for teachers, curriculum designers, and administrators of school, from elementary school to university.

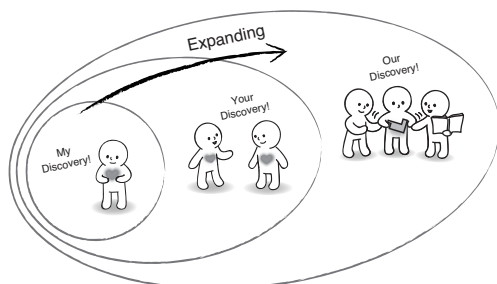
Every pattern is written in the same manner: pattern name, introductory sentence, illustration, context, problem, solution, consequence, cases, and references; the sentences after the illustration describe context of the pattern; a bold-typed sentence just after the word “▼ In this context” is the key point of problem; a bold-typed sentence just after the word “▼ Therefore” is the key point of the solution; and sentences after the word “▼ Consequently” describe consequences of the pattern; and paragraphs after the separator * provide an example of the solution. All cases we introduce in this paper are the practices of Chikara Ichikawa at the Tokyo Community School, Japan [8].

3. PATTERNS

Here we present three patterns for designing and facilitating creative learning: Discovery-Driven Expanding, Challenging Mission, and Generative Participant.

Discovery-Driven Expanding

*Creative mind isn't built in a day.
In designing a curriculum, set the goal in stages,
from individual to collaborative achievement.*



You want to introduce a type of learning as an alternative style into your school or class, which is learner-centered learning (Norman and Spohrer, 1996), rather than conventional styles of knowledge transfer. Learner-centered style does not mean to let learners do anything they like, since there must be an intention what you want them to learn. So you need to DESIGN curriculums to meet two different requirements: autonomy and growth of learners. You may know collaborative learning, which is a kind of creative learning, is well known to be a good way for realizing learner-centered learning, where more than one people collaborate toward a shared goal, and learn through the process.

▼ In this context

If you introduce collaborative learning as a way for learner-centered learning suddenly, it is difficult for learners to perform and learn from their experience effectively. It is because collaborative learning requires the abilities of thinking and communication to some extent. In other words, learners need to welcome discoveries of others and their team.

▼ Therefore

Set the goals in the curriculum according to the stage of learners, where they can expand the ability gradually through the accumulation of creative learning: individual, interpersonal, and collaborative achievement. In first stage, set the goal on individual achievement, and encourage learners to display their personality. They will learn through obtaining “my discovery.” In second stage, set the goal on interpersonal achievement, and encourage learners to display their personality and understand others by having conversation. They will learn through obtaining “your discovery.” In third stage, set the goal on collaborative achievement, and encourage learners to make a result with others by having collaboration. They will learn through obtaining “our discovery.”

Note that this solution is consistent with the theory of learning suggested by Y. Engeström (1987), which is the extended theory of the Zone of Proximal Development (ZPD) hypothesis proposed by L. S. Vygotsky (1978), the model of learning is expanding their capacity, skill, concepts and so on.

▼ Consequently

Learners expand their capacity in stages. In first stage, namely in the stage for personal achievement, learners become to be willing to tell their own idea and opinion. In second stage, namely in the stage for interpersonal achievement, learners become to recognize ideas and opinions of others and expand their perspective. In third stage, namely in the stage for collaborative achievement, learners become to take ideas and opinions of others and synthesize them to make their result.

* * *

For instance, Tokyo Community School designs the curriculum for elementary school students based on Discovery-Driven Expanding, where children expand meta-cognitive thinking gradually through six-years accumulation of learning as follows.

In first and second grades, the class entitled “I am Special” offers students to reflect his/her life and aware that he/she has individual autonomy. In the class, a teacher has students observe himself/herself and interview his/her family in order to know his/her special characteristics. They finally draw “my portrait map” as a summary of their own discovery. Learning through “my discovery” provides a starting point for successive discoveries in the future and enhancing their self-efficiency.

In third and fourth grades, the class entitled “Balanced Nutrition” offers students to think about food nutrition. In the class, students design his/her original lunch with using his/her favorites and recommending ingredients. They finally cook it and hold a tasting party. In the party, students taste others’ lunch and will think, “Your discovery is great!” Learning through “your discovery” provides opportunity for students to recognize the uniqueness of him/her and also others.

In fifth and sixth grades, the class entitled “Future Funeral” offers students to imagine their future. In the class, they write drama scenario of the future together, which is a story that their former teacher will dead thirty years later. The finally perform based on the scenario as a drama. Learning through “our discovery” provides opportunity for students to recognize the power of collaboration.



Original lunch presentations in “Balanced Nutrition” for 3rd and 4th grades: Students have opportunities to share their original ideas, they know the value of accepting other’s objective appraisal.



The play of “Future Funeral” of their teacher in 5th and 6th grades: Students have to co-think and co-create for making drama scenario. The experience of making one drama scenario collaboratively and brushing up the acting together make them nurture the attitude how they work for collaborative discovery.



“My portrait map” in 1st and 2nd grades: Students aware their own uniqueness, and then they have confident to contribute to meaningful discovery

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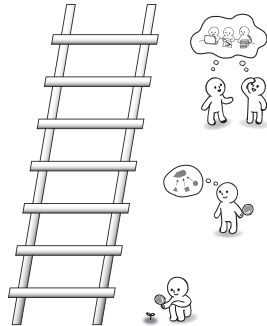
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Challenging Mission

Design missions that are effective for learning, attractive, worthwhile to challenge, and at the appropriate levels of difficulty.



You are about to design missions fit to the curriculum that you have already designed based on Discovery-Driven Expanding. While you can find a lot of resources for conventional education for acquiring knowledge or skill of subjects, you realize that the resources for creative learning has not been developed enough. Thus, you find that you need to develop what you need in your class. What is most important is to design missions for creative learning.

▼ In this context

There are many missions that tend to be unsuitable to creative learning because they either make learners too free and unfocussed. If you make a mission based on the interests of students, it will become happy experience for them but hardly achieve epistemic change by learning. If you make a mission related to the subjects, it will be worthwhile to study but hardly educe autonomy and creativity of the learners.

▼ Therefore

Design missions that are effective for learning, attractive, and worthwhile to challenge, and at the appropriate levels of difficulty, increasing the difficulty level of missions gradually as follows: discovering the visible, discovering the invisible, and discovering how to discover. In first step, set missions for discovering something visible in a field. In second step, set missions for discovering something invisible hidden in the visible. In third step, set missions for discovering how to discover the solution for their mission.

For realizing creative learning, it is most important to organize missions that lead the learners to expand themselves gradually from their current levels. It seems be of the value to refer to the Learners Profile (International Baccalaureate Organization, 2008), and as a result missions can be designed for expanding the competencies of learners profile.

In addition, the missions need to contain the mysterious or interesting aspect in order to fascinating the learners. Also, the missions should be worthwhile to challenge because they are future-oriented and socially rooted. Finally, the difficulty levels of the missions need to be considered, where it is necessary that the missions look hard but they are possible to be completed.

▼ Consequently

Learners expand their capacity in stages, because it is necessary for them to nurture challenging mind gradually. In first step, learners become aware of the objects, behavior, and characteristics that are not focused before. In second step, learners become to think mechanisms and relationships hidden in visible things. In third step, learners become to develop their way to do things.

* * *

For instance, C. Ichikawa designs projects based on Challenging Mission at Tokyo Community School. In first and second grades, the class entitled “Leaves Wonder” offers students to collect leaves as many as possible in the park next to school. The mission is “Closely observe the visible form of leaves and analyze them from original point of view.” Students cannot finish their study just classifying leaves relying on a field guide, they have to discover some unique findings with reason. In third and fourth grades, the class entitled “Water Purifying” gives students to mission; “Make the drinkable water”. Students make handmade water purifiers using plastic bottles, they purify rain water by use of it. In spite of getting clear water, they suspect they cannot drink it, because there is some invisible harmful thing in the water. They have to challenge discovering the method how to get rid of invisible things. In fifth and sixth grades, students do a mission entitled “space fantasy”. The mission is, “Create the Science-Fiction story where the characters jump out to space for expanding the possibility of human species” with the constraints that they need to make characters with a certain Learner Profile: Open-minded, Risk-takers and Principled. In the activity, learners start to think why human need to jump out to space, and then they discussed it. Students thought and understood social and environmental problems that human is facing deeper and deeper.



“Leaves Wonder” for discovering the visible: Students investigate visible form of leaves. They categorize and interpret according to their original discovery.



“Water Purifying” for discovering the invisible: When meeting with large earthquake, we have no water supply. To get drinkable water is truly authentic matter, students desperately investigate to discover invisible mechanism.



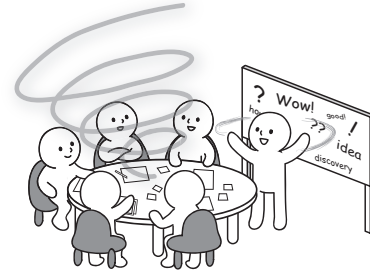
“Create the Science-Fiction Story” for discovering how to discover: Some constraints (Science Fiction, positive ending, character’s personality) that were given to students drove them to think creatively and discuss lively. This Challenging Mission convinced them how to discover their own discovery.

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International Baccalaureate Organization, *IB learner profile booklet*, 2008

Generative Participant

Encourage students in thinking, communicating, and creating, as a participant in the activity rather than a teaching actor.



You are about to facilitate creative learning in the classroom, after you have designed the curriculum based on Discovery-Driven Expanding and the mission based on Challenging Mission. Thanks to the accumulation of learning through Discovery-Driven Expanding, the learners feel easy to say their ideas and approve other’s ideas. Also, thanks to the series of experiences through Challenging Mission, the learners are ready to cope with the difficulty of the mission.

▼ In this context

Communication for the collaboration doesn’t always go smoothly, and often stops and sometimes falls into the situation where a very few members control the flow and others follow it. In such a situation, teachers’ direct control of the flow often inhibits creative learning, and therefore learning through creation does not occur. This problem has been discussed for a long time in the study of collaborative learning such as Palincsar et al. (1987). The most important point of creative learning is successive emergence of discoveries. So learners must continue to produce discoveries not by thinking but also by communication.

▼ Therefore

Consider you as a participant in the activity rather than a teaching actor, who contributes to produce some of discoveries in the creation and also encourage your partners (learners) to think and communicate. More concretely, tell your ideas, opinions such as “Oh! That’s a nice idea!” and questions such as “Do you mean ...?”, which assist to accelerate the flow of communication and reconsider their ideas. It does not mean the control of the flow from outside. Rather, it is the influence from inside.

▼ Consequently

Learners can keep concentration into the creation and feel the progress, and therefore they learn through the creation.

Moreover, learners become to deeply understand the value of collaboration with others, so to be willing to enjoy creative dialogues.

* * *

For instance, C. Ichikawa participates into his class entitled “Future Funeral” at the Tokyo Community School based on Generative Participant. Since it is quite difficult for children to imagine their future concretely how and what they will be thirty years later, he first shows an example of chronology of his future. It includes many things such as good, bad, proud and shame things frankly, and he presented to them, and inspires the students to make their own chronology. In the halfway of writing, he has students give a presentation about their chronology to each other, and brush-up their chronology. In all phases, he tells his ideas, opinions and questions in order to assist to accelerate the flow of communication and reconsider their ideas.



Generative Participant to “Future Funeral”: The setting of not just imagine 30 years later but assume to meet at the “future funeral” of their elementary teacher makes students feel authentic. Both a teacher and students have no exact answer, they are doing the creative dialogue in order to forecast the future. A teacher participate the discussion not only to facilitate students but also to present teacher’s view straightly.

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4. CONCLUSIONS

In this paper, we proposed pedagogical pattern language for creative learning, and present three core patterns. These patterns are intended to constitute a part of the whole language, which will be presented in the succeeding papers. The pattern language presented in this paper is a kind of languages known as pedagogical patterns [1, 3] in broader sense. Connecting these studies, we would like to develop and improve languages in order to help teachers to attain better education.

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