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# **The generation process of hierarchical gap in failure knowledge constructs using PAC analysis**

- A Case study on R&D projects at a corporate laboratory -

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**Keywords:** Failure knowledge construct, PAC analysis, R&D management, Concept

This paper studies the generation process of hierarchical gap in failure knowledge schematically and tries to clarify its relation to organizational problem at a corporate laboratory.

This paper deals with 13 personal knowledge constructs formed of failure experience in 4 R&D projects at 'I' corporate laboratory, which all caused serious trouble. In this paper, this object is called "the failure knowledge construct."

In this paper, the failure knowledge construct is defined as "The personal construct of justified belief, which is consisted of information clusters based on the failure experience."

This paper sets up the following procedures to achieve goals:

1. Construct the model for every person based on the failure knowledge construct using PAC (Personal Attitude Construct) analysis.

2. Compare the models of failure knowledge construct analysis of the research manager class and the research worker class.

Based on above-mentioned procedure, this paper found following hierarchical gap points:

1. Research manager's clusters about the concept all have positive (+) images, while research worker's cluster about it have other images; negative (-), conflict (plus vs. minus) or dissociation (0). The failure knowledge construct of the research worker also has the case where there is no cluster about it.
2. All Research managers have highly concern to the cluster about the concept, while almost all research workers have highly to the cluster about the environment.
3. Research manager's relation of the cluster about the concept and cluster about the environment all show strength, while research worker's it changes depends on images of the cluster about the concept.

The above-mentioned findings showed the reconstruction process of the knowledge about the concept. In this paper, the knowledge about it is defined as "the cluster about the concept." It progresses to "the creation stage of a question" through the failure experience. Next, a question is created, a conflict state will be born and it will progress to "the generation stage of an answer." Finally, If an answer is generated, conflict state will be canceled and it will progress to a "The stage of practice." If verification of an answer is performed by practice, the positive (+) image will be added to the knowledge about the concept.

The research worker is not so although this process works well in research manager's case. If it does not advance to a "the creation stage of a question" stage, the image of the knowledge about concept is set to dissociation (0) or the knowledge about the concept itself is eliminated. Moreover,

if it does not clear "The generation stage of an answer", the image of conflict (plus vs. minus) is held, and the image of minus is held if it does not clear "The stage of practice".

Thus the generation process of hierarchical gap in failure knowledge constructs is defined as "the process from which an error takes place in the reconstruction stage of the knowledge about the concept."

The most important theoretical implication of this paper is that the dissociation (0) and the elimination of the knowledge about the concept state is obstacle factor of organizational knowledge creating activities.

The most important practical implication of this paper is that the act which influences organizational sharing of the positive image of the knowledge about the concept is indispensable in the meaning of playing a role of a manager's symbol.