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Introduction

The creative problem solving procedures in this handbook are based on a particular system for classifying problems. First, problems are classified as a certain type or a particular stage. These stages or types are:

Information Deficient

Idea Deficient

Solution Deficient

Solution Testing

Creative problem solving techniques do not necessarily have to be used at all stages of the problem solving process. They are only required when there is no obvious way to proceed or when the obvious way isn't satisfactory. Sometimes, for example, a problem may exist simply because of lack of information. Once the information is obtained, the way to proceed may be obvious. Sometimes a problem may be encountered when it is already at a later stage such as **solution deficient**. In such an instance, all the information and ideas may have been researched and organized for us, and we simply have to use creative problem solving procedures if an optimum solution method is not readily apparent.

The same problem may be a different type of problem for two different people. If one person has a great number of ideas on the topic, the problem may be **solution deficient**. If the other person has only a few ideas on the topic, the same problem may be at the **idea deficient** stage for that individual.

There are seven creative problem solving procedures presented in this handbook. Each procedure is presented in a separate chapter which provides instructions for its use and examples to illustrate its application to an **information deficient** problem vs. an **idea deficient** problem. (As indicated in Figure 2, **solution testing** problems are, in effect, **information deficient** problems.)

To select an appropriate creative problem solving procedure, the characteristics of the problem have to be considered. Figure 2 shows the characteristics of problems matched with appropriate creative problem solving procedures. Often, more than one procedure may be suitable and valuable to use.

To make the fullest use of creative problem solving procedures, it is important to identify all aspects of the problem about which information or ideas are needed. This can involve rephrasing problems and breaking them down into their main elements to clarify where and how creative problem solving procedures should be applied. An example of this process is provided in Chapter 9.

It can be difficult to be creative without a problem that requires a creative solution. Chapter 10 provides ideas about how to design problems that both require and provide scope for the use of creative thinking.

Figure 1: Classification of Problem Types or Stages

PROBLEM TYPE OR STAGE	GENERAL DESCRIPTION	EXAMPLES
Information Deficient	A decision or plan has to be made or a product has to be designed, but more information is needed first.	Buying or making a birthday present for someone you don't know.
Idea Deficient	A solution has to be developed and the usual or available ideas are not satisfactory.	Coming up with a "gift idea" for someone who you know well but is difficult to buy for.
Solution Deficient	So many ideas or ways of approaching the problem are possible that it's difficult to pick a direction or focus and get started.	Write a poem about nature.
Solution Testing	A solution plan has been developed or suggested but needs to be evaluated or tested before being implemented.	A class has developed a plan for an afternoon of activities to entertain a class of younger students.
	OR Two or more solution plans are available and they need to be evaluated in order to select the best one.	A class must choose one of three plays as the one to perform for a special occasion or audience.

Figure 2: Matching CPS Procedures to Problem Types and Characteristics

CPS Procedures	Problem Types or Stages	
	Information Deficient Problems	Idea Deficient Problems
Attributes - Brainstorm Implications	The problem has a central feature, e.g., object, person, event, animal, idea.	The problem has a central feature, e.g., object, person, event, animal, idea.
Brainstorm —Categorize —Brainstorm	The problem is complex, i.e., involves many objects, persons, activities, etc.	The problem is one for which it is easy to brainstorm an initial list of diverse ideas.
Analogies —Categorize	The problem is novel and it is difficult to imagine what kinds of information would be relevant.	The problem is one for which it is difficult to generate any ideas at all or any novel ideas.
Future Projection	The product or plan to be chosen or developed will be used or have effects during a period of time.	The problem is one for which the consideration of different points in time can be a source of ideas.
Interest Groups	The product or plan to be chosen or developed will involve or affect various groups or individuals.	The problem is one for which the perspectives of different groups or individuals can be sources of ideas.
Imposing Constraints	The problem is novel and it is difficult to imagine what kinds of information would be of use and interest.	
Empirical Testing	The problem is one for which "armchair analysis" and secondary sources of information are inadequate for posing questions for information deficient problems or for answering questions for solution testing problems.	The problem is one in which the manipulation of objects, etc., or the pilot testing of a prototype can generate ideas.