

## Appendix A

### Gubbin's Matrix of Thinking Skills

(Adapted from Sternberg<sup>1</sup>)

#### Problem solving

1. Identifying general problem
2. Clarifying problem
3. Formulating hypothesis
4. Formulating appropriate questions
5. Generating related ideas
6. Formulating alternative solutions
7. Choosing best solution
8. Monitoring acceptance of the solution
9. Drawing conclusions

#### Decision Making

1. Stating desired goal/condition
2. Stating obstacles to goal/condition
3. Identifying alternatives
4. Examining alternatives
5. Ranking alternatives
6. Choosing best alternative
7. Evaluating actions

#### Inferences

1. Inductive thinking skills: determining cause and effect, analyzing open-ended problems, reasoning by analogy, making inferences, determining relevant information, recognizing relationships, solving insight problems

2. Deductive thinking skills: using logic, spotting contradictory statements, analyzing syllogisms, solving spatial problems.

### **Divergent thinking skills**

1. Listing attributes of objects/situation
2. Generating multiple ideas (fluency)
3. Generating different ideas (flexibility)
4. Generating unique ideas (originality)
5. Generating detailed ideas (elaboration)
6. Synthesizing information

### **Evaluative Thinking Skills**

1. Distinguishing between facts and opinions
2. Judging credibility of a source
3. Observing and judging reports
4. Identifying central issues and problem
5. Recognizing underlying assumptions
6. Detecting bias, stereotypes, clichés
7. Recognizing loaded language
8. Evaluating hypothesis
9. Classifying data
10. Predicting consequence
11. Demonstrating sequential synthesis of information
12. Planning alternative strategies
13. Recognizing inconsistencies in information
14. Identifying stated and unstated reasons
15. Comparing similarities and differences
16. Evaluating arguments

### **Philosophy and Reasoning**

1. Using dialogical/dialectical approaches

### **Notes**

<sup>1</sup> Quoted in Robert Sternburg, *Critical Thinking: Its Nature, Measurement and Improvement*, ED 272 882, (Washington, D.C.: U.S. Dept. of Education, 1986), 32.