

AN INITIAL INVESTIGATION INTO TEACHER ACTIONS THAT SPECIFICALLY FOSTER MATHEMATICAL CREATIVITY

Emily Cilli-Turner
University of La
Verne

Milos Savic
University of Oklahoma

Houssein El Turkey
University of New Haven

Gulden Karakok
University of Northern
Colorado

Gestalt principle:

- allow for freedom of time and movement;
- discuss explicitly that time, effort, and energy are needed to solve problems;
- assign challenging problems and tasks.

Aesthetic principle:

- point out the elegance/novelty/beauty of certain solutions/approaches;
- point out connections between disparate ideas in problem solving;
- point out any atypical thinking/solutions;
- point out simple solutions to complex problems.

Free market and scholarly principles:

- encourage students to present their solutions and approaches;
- encourage students to defend their solutions and approaches;
- value students' contributions;
- not penalize students for trying a different approach and failing;
- encourage students to debate and discuss the teacher's approaches and the other students' approaches/presentations;
- elaborate on how these discussions contribute to the process of knowledge building;
- point out when a student builds on the work of another student;
- encourage students to make generalizations;
- allow students to problem pose.

Uncertainty principle:

- point out the difficulty and uncertainty of doing mathematics when students are working on challenging tasks;
- provide affective support to students when they experience frustrations;
- encourage perseverance;
- expose students periodically to examples from history to explain that certain concepts took years/centuries to develop.