Reasoning-and-Proving Framework

<table>
<tr><th></th><th colspan="4">Reasoning-and-Proving</th></tr>
<tr><td rowspan="3">Mathematical Component</td><td colspan="4">What are the major activities involved in reasoning-and-proving?</td></tr>
<tr><td colspan="2">Making generalizations</td><td colspan="2">Developing arguments</td></tr>
<tr><td>Identifying a pattern (plausible or definite)</td><td>Making a conjecture</td><td>Developing a proof (generic argument or demonstration)</td><td>Developing a non-proof argument (empirical argument or rationale)</td></tr>
<tr><td>Learner Component</td><td colspan="4">What are students' perceptions of the mathematical nature of a pattern/conjecture/proof/non-proof argument?</td></tr>
<tr><td>Pedagogical Component</td><td colspan="4">How does the mathematical nature of a pattern/conjecture/proof/non-proof argument compare with students' perceptions of this nature?

How can teachers help their students reconsider and change (if necessary) their perceptions to better approximate the mathematical nature of a pattern/conjecture/proof/non-proof argument?</td></tr>
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Source: Stylianides (2008)