Examining Beginner Computer Programmers' Procedural Logic using the Escape Room Model

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Background

Beginner programmers struggle to learn object-oriented programming due to unfamiliar syntax and difficulty visualizing abstract concepts. Their biggest impediment, however, is the lack of procedural logic to support object logic.

Procedural logic is the natural sequence of steps executed to solve a problem. Object logic is the understanding of objects' properties and functions in code.

The escape room is a fast-paced challenge in which participants collaborate to solve puzzles, interpret clues, and escape in time. The escape room is an experiential learning model that can bridge the gaps in beginner programmers' understanding of programming.

Methods

- 6 teams compiled from three introductory programming courses each must complete the escape room in 1 hour.

- Tools: observation, scaling, quantitative and qualitative surveying.

- Quantitative: measure the correlation between a team's completion time and procedural score (RQ1).

- Qualitative: examine the relationship between a team's procedural score and the quality of their object-related responses (RQ2).
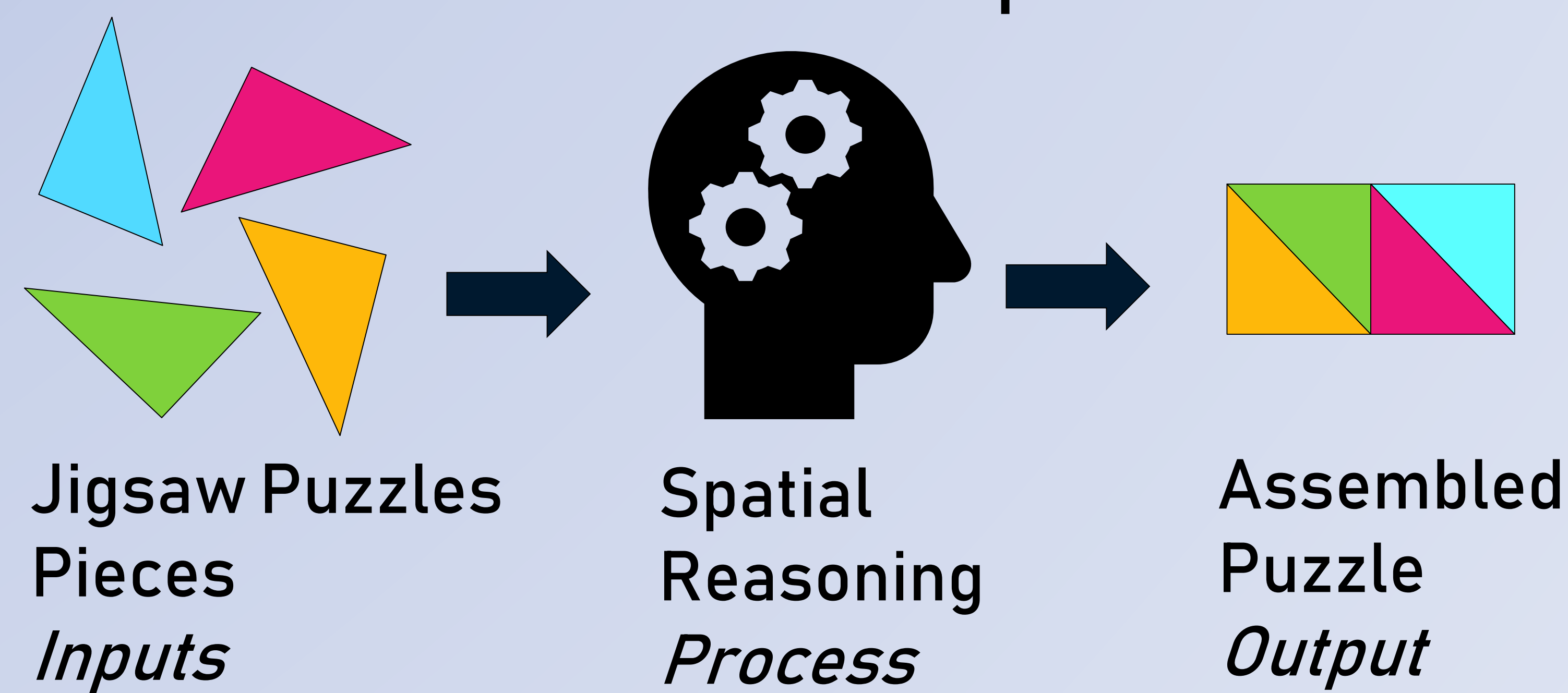
Research Questions

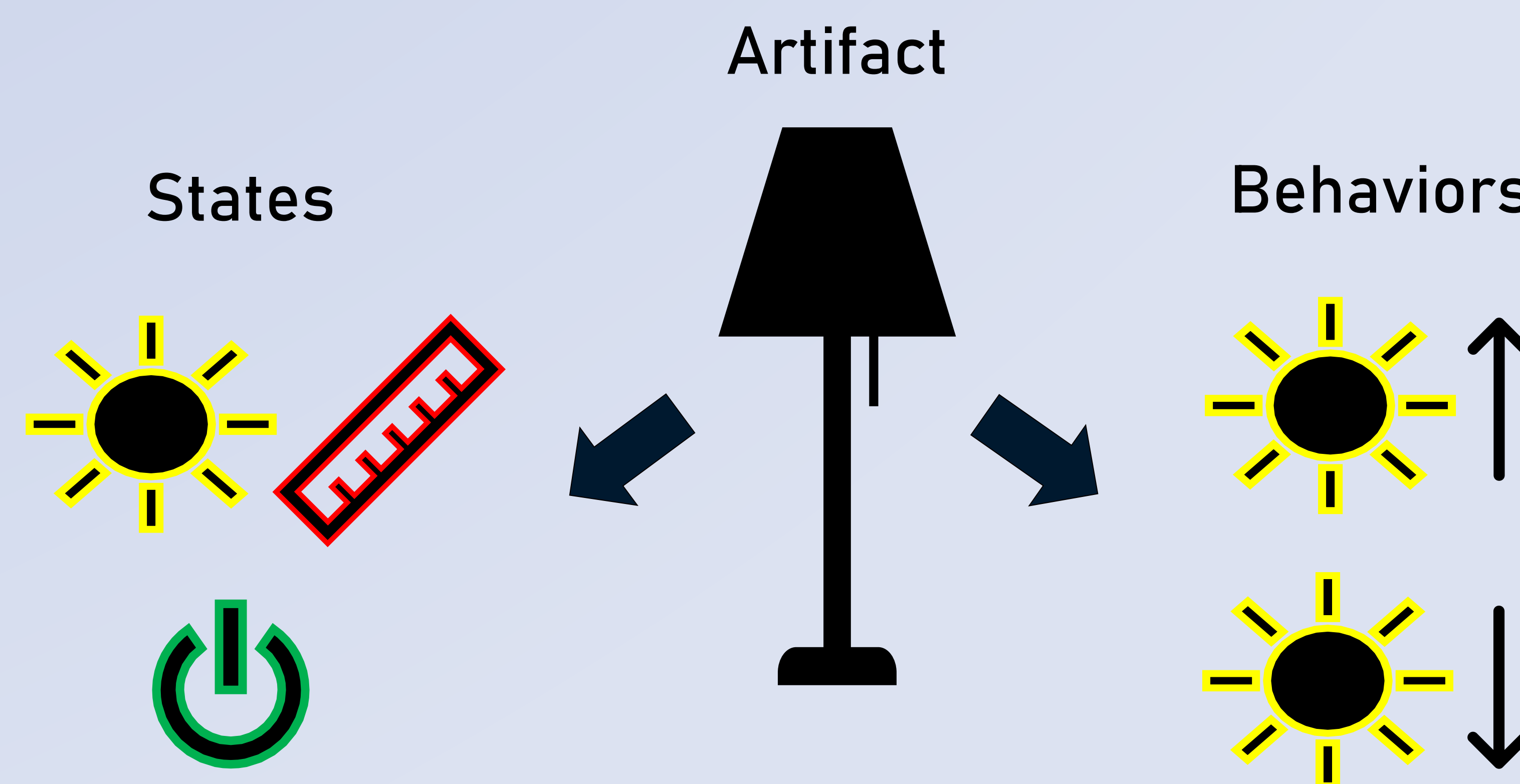(RQ1) Do teams who solve the room faster demonstrate stronger canonical procedures?

(RQ2) Does a strong canonical procedure aid participants' object logic?

Discussion

Process Conception

Jigsaw Puzzles Pieces
Inputs

Spatial Reasoning
Process

Assembled Puzzle
Output

Object Conception

Artifact

States

Behaviors

Anticipated Results

Figure VIII. Teams' Procedural Scores on a Scale

Weak   Adequate   Strong

T6 T5 T4   T3   T2 T1

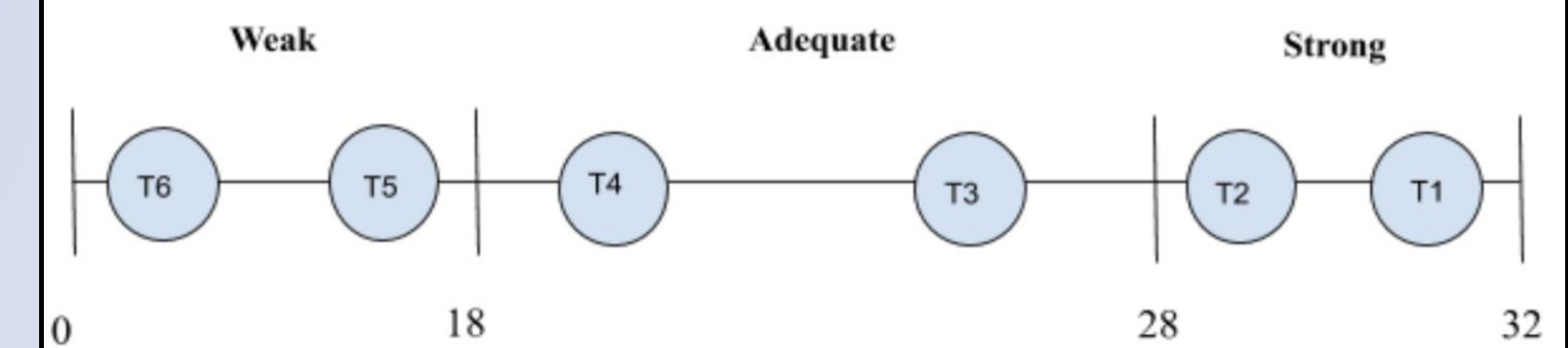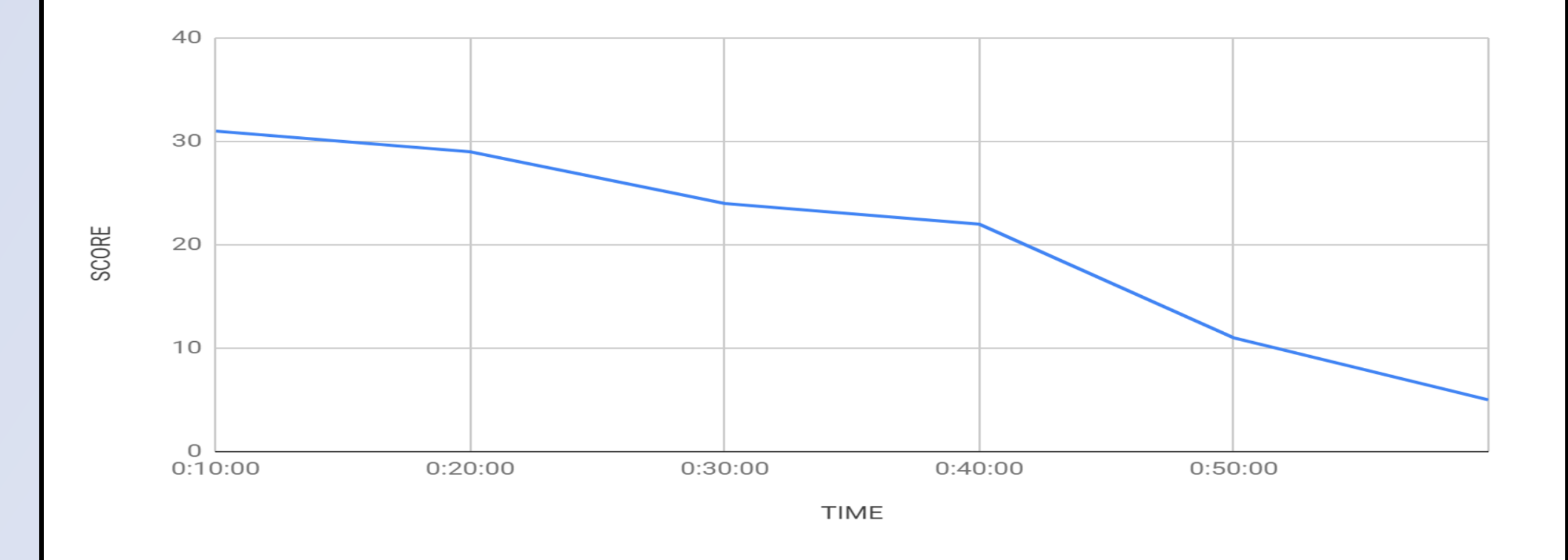0   18   28   32

Figure X. Measuring Teams' Completion Time versus Procedural Score

Selected References

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