

INTEGRATION OF BLENDER 3D IN BASIC COMPUTER GRAPHICS (CG) COURSE



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DIFFICULTIES IN LEARNING BASIC CG

VISUALIZING CONCEPTS - 3D TRANSFORMATIONS [1,2,3]

EXISTING SOLUTIONS

DRAWINGS, VERBAL EXPLANATIONS, SUPPORTIVE HAND GESTURES, JAVA 3D, OPEN GL, ANIMATIONS [4,5,6]

OUR SOLUTION

INTEGRATION OF BLENDER 3D (OPEN SOURCE 3D CONTENT CREATION TOOL)

RESEARCH METHODOLOGY

PURPOSE

To evaluate the effect of blender intervention in solving transformations problems in cg.

RESEARCH QUESTIONS

1. How do students use blender to visualize transformation concept in cg?
2. Does blender motivate students to learn computer graphics concepts?

SAMPLE

22 second year MCA students (with prior knowledge of transformations), 6 for think-aloud

RESEARCH DESIGN

Qualitative

TREATMENT

CG instructions + Blender training [7]

POSTTEST: CG PROBLEM

Question on composition of 3D transformations using Blender and with think-aloud.

INSTRUMENT & DATA COLLECTION

Think aloud method, Audio/video/screen recording of students problems solving behaviour, survey

DATA ANALYSIS PROCEDURE

Students' behavioral patterns

RESULTS

Multiple representations: sequence diagram, graphs

BLENDER TRAINING [7]

1. BLENDER USER INTERFACE
2. CG INSTRUCTIONS USING BLENDER

LEARNING OBJECTIVE

RATIONALE

ACTIVITIES

1. Blender User Interface
2. 2D & 3D Transformations using Blender

DEMO - Instructor

DRILL - Students

PRACTICE - Students

POSTTEST: CG PROBLEM

T1: Translate 1x, 2y, 3z

T2: Translate 2x, 2y, 2z

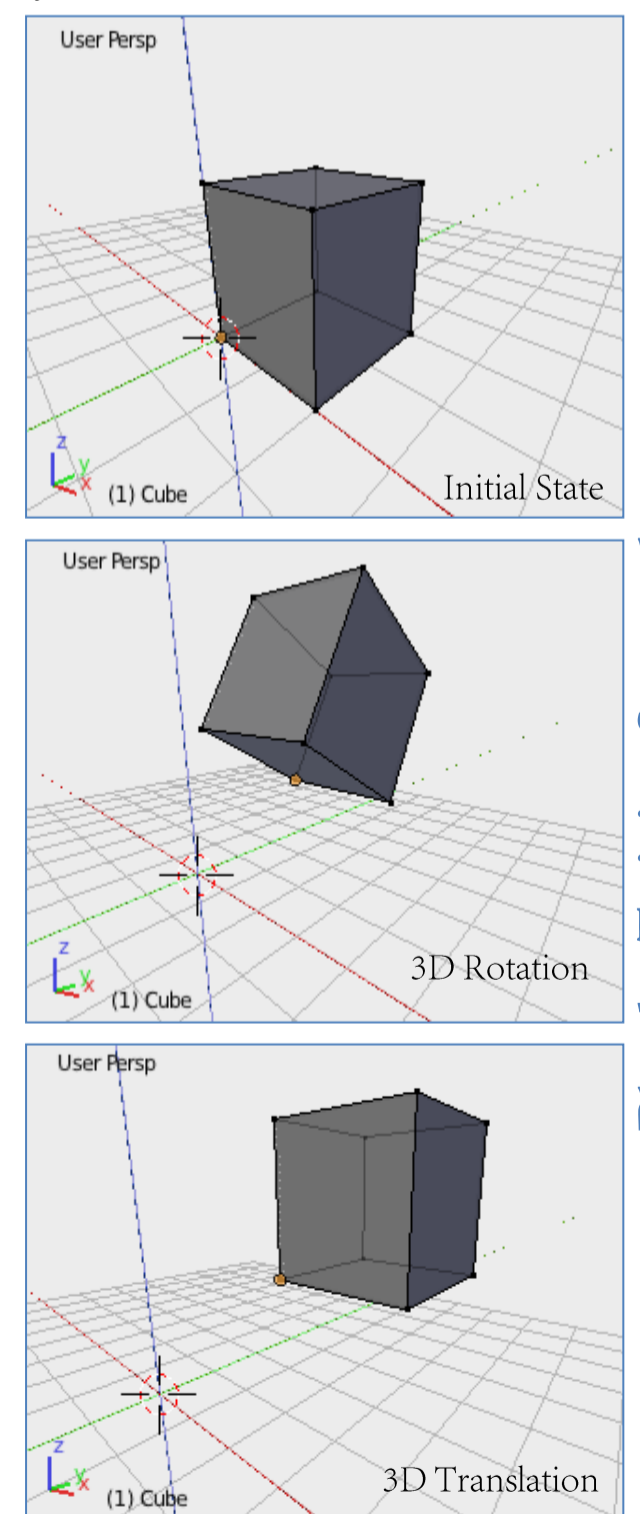
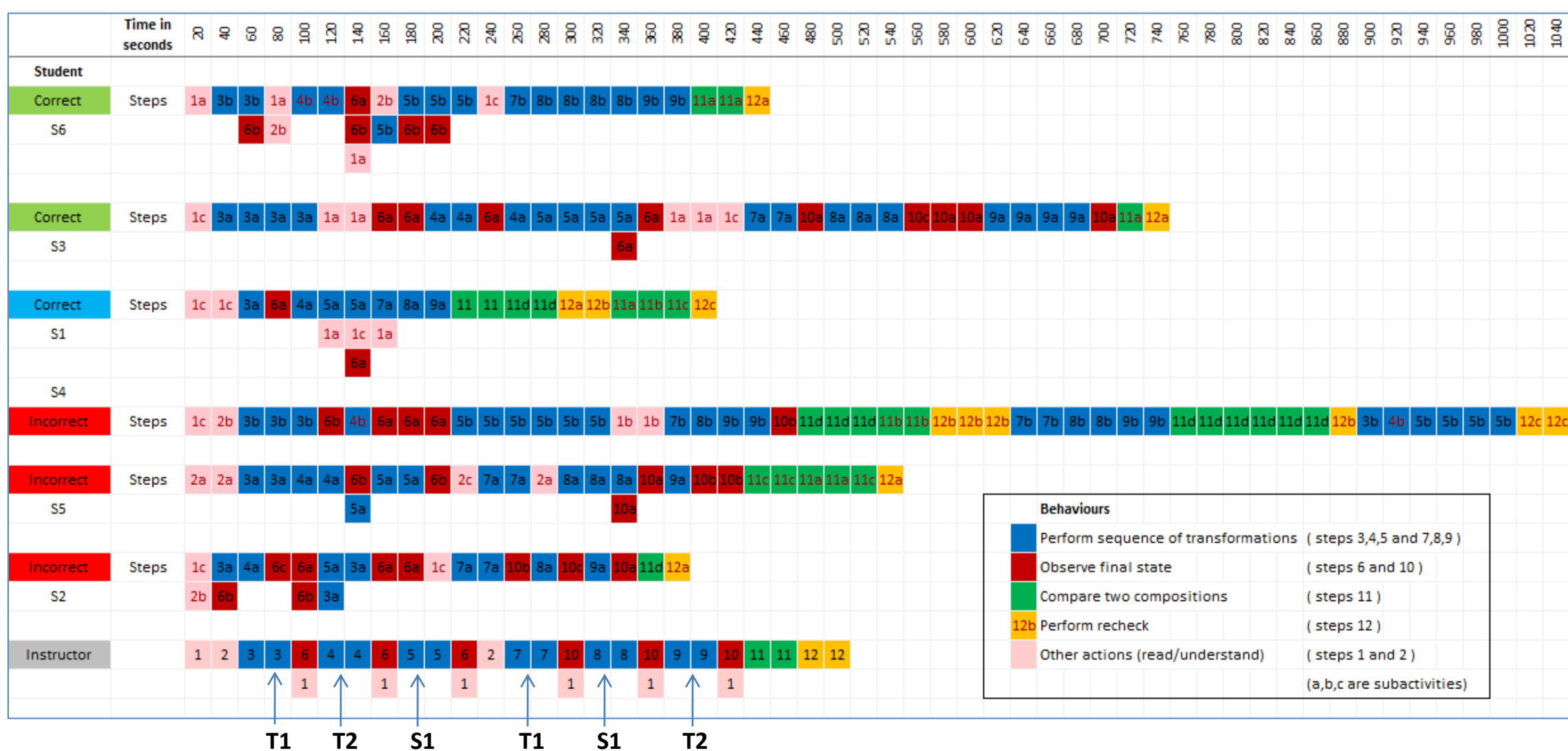
S1: Scale 1x, 2y, 3z

Problem: Perform the following two compositions (C1, C2) of transformations, and identify whether they are commutative or not.

C1 T1 + T2 + S1

C2 T1 + S1 + T2

Figure 1: Sequence of occurrences of behaviours and actions performed by students, across time



FINDINGS

- The study provides insights on how students use Blender features to solve transformations problems.
- It also shows that Blender training module has increased their interest in learning and solving CG problems like transformations.
- In future, more such modules can be designed for other CG concepts which require visualization.

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