

## Appendix A

### LOGO Commands

COMMANDS	FUNCTION	EXAMPLE
COLOUR	Changes the colour of the text and the drawing line created by the turtle (arrow).	COLOUR 3
TASK	Displays the current task.	TASK
UP	Allows the turtle to be moved without leaving a trail. An analogy is to lift a pencil up from a sheet of paper.	UP
DOWN	Reverses the UP command so that a trail is drawn every time the turtle is moved.	DOWN
RUBBER	Turns the turtle into an eraser and erases any part of a drawing that the student draws over. (Use DOWN to draw again.)	RUBBER
WRAP	Continues any line that goes over the screen boundary on the opposite side of the screen.	WRAP
FENCE	Stops any line at the screen boundaries	FENCE
SHOWTURTLE	Makes the turtle visible.	SHOWTURTLE
HIDETURTLE	Makes the turtle invisible.	HIDETURTLE
LEFT	Rotates the turtle the specified number of degrees to the left.	LEFT 30
RIGHT	Rotates the turtle the specified number of degrees to the right.	RIGHT 60
FORWARD	Moves the turtle in the direction it is heading the given number of units.	FORWARD 50
BACK	Moves the turtle in the opposite direction from which it is heading the given number of units.	BACK 100

COMMANDS	FUNCTION	EXAMPLE
CLR	Clears the upper section of the screen (the graphics area), and positions the turtle in the centre of the area, heading downwards.	CLR
PRINT	Echoes any words written after this command back to the student.	PRINT HELLO
IF	The IF statement has the format: if condition {list of commands} If the condition is satisfied then the list of commands is performed.	IF X > 0 FORWARD X
REPEAT	The REPEAT statement has the format: repeat number {list of commands} Repeats the list of commands the given number of times.	REPEAT 4 BACK 9 LEFT 90
TO PROCNAME	Creates a procedure called PROCNAME. A procedure is a list of commands referred to by a single name. (All following commands are saved under the given name until the END command is given.)	TO SQUARE
PROCNAME	Actions a procedure with the name PROCNAME. That is, it processes the commands saved under the given name.	SQUARE
REMOVE PROCNAME	Deletes the procedure with name PROCNAME.	REMOVE SQUARE
EDIT SQUARE	Enters the LOGO editor to allow the individual lines of an existing procedure to be changed.	EDIT SQUARE
STOP	Quits the current task.	STOP

## Appendix B

### Case Study One - Experiment One

The following questions are samples from each of the tasks given to the twenty-six students involved in case study one. The tasks were designed to measure the students parallel and serial processing capabilities.

- Number Span Task

The following seven numbers were read out to the students who then had to write them down in the exact order:

14    5    23    7    6    9    40

- Letter Span Task

The following seven letters were read out to the students who then had to write them down in the exact order:

H    C    S    I    V    P    T

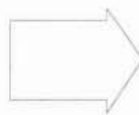
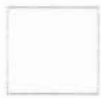
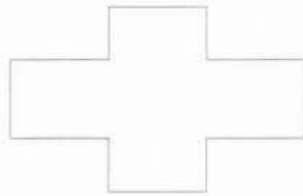
- Word Span Task

The following five words were read out to the students who then had to write them down in the exact order:

play            tree            rein            spade            snail

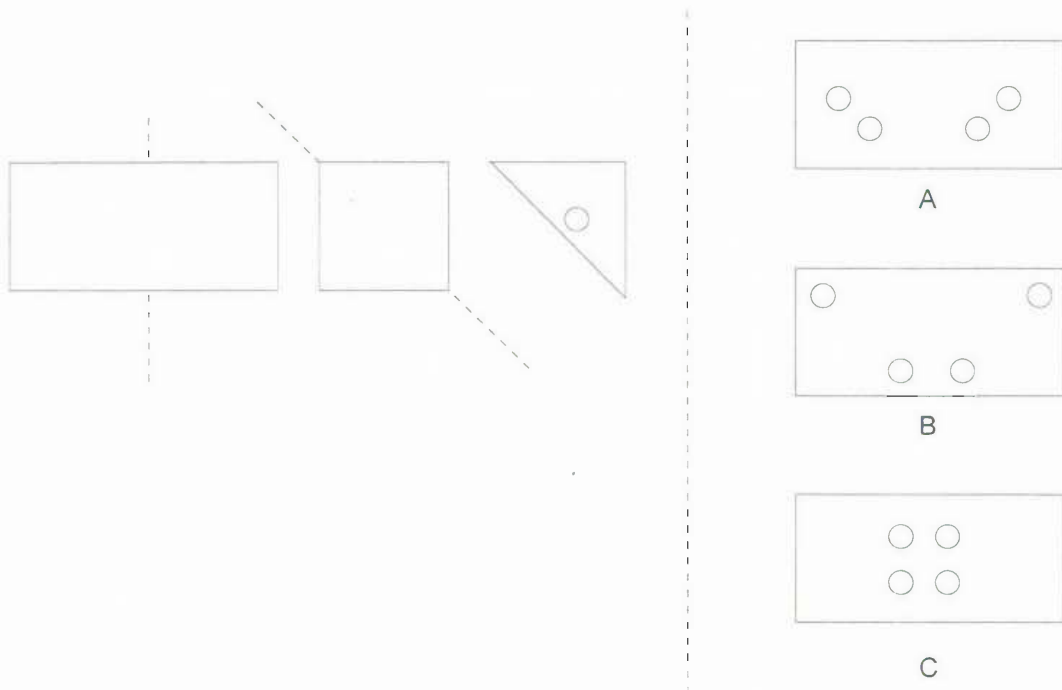
- Shapes Task

The students had to pick one shape out of each of the four rows and use the four shapes to make the shape at the top of the page. The students were given seven minutes to do this.



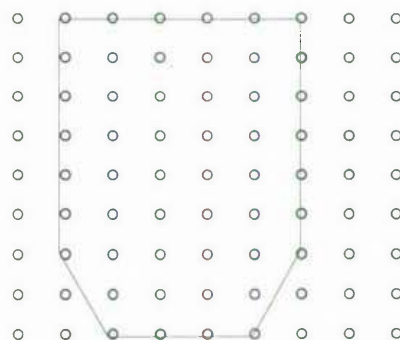
- Paper Folding Task

The students had to imagine that the figure on the left-hand side was folded, and then had a hole punched in it. The students had to select which of the figures on the right-hand side represented where the holes would be when the figure was unfolded.



- Matrix Task

The students were given sheets containing eighteen 9x9 dot matrices. The students were briefly shown a shape drawn by joining up the dots in a matrix, and they were asked to reproduce the drawing.



## Appendix C

### Lesson Structures

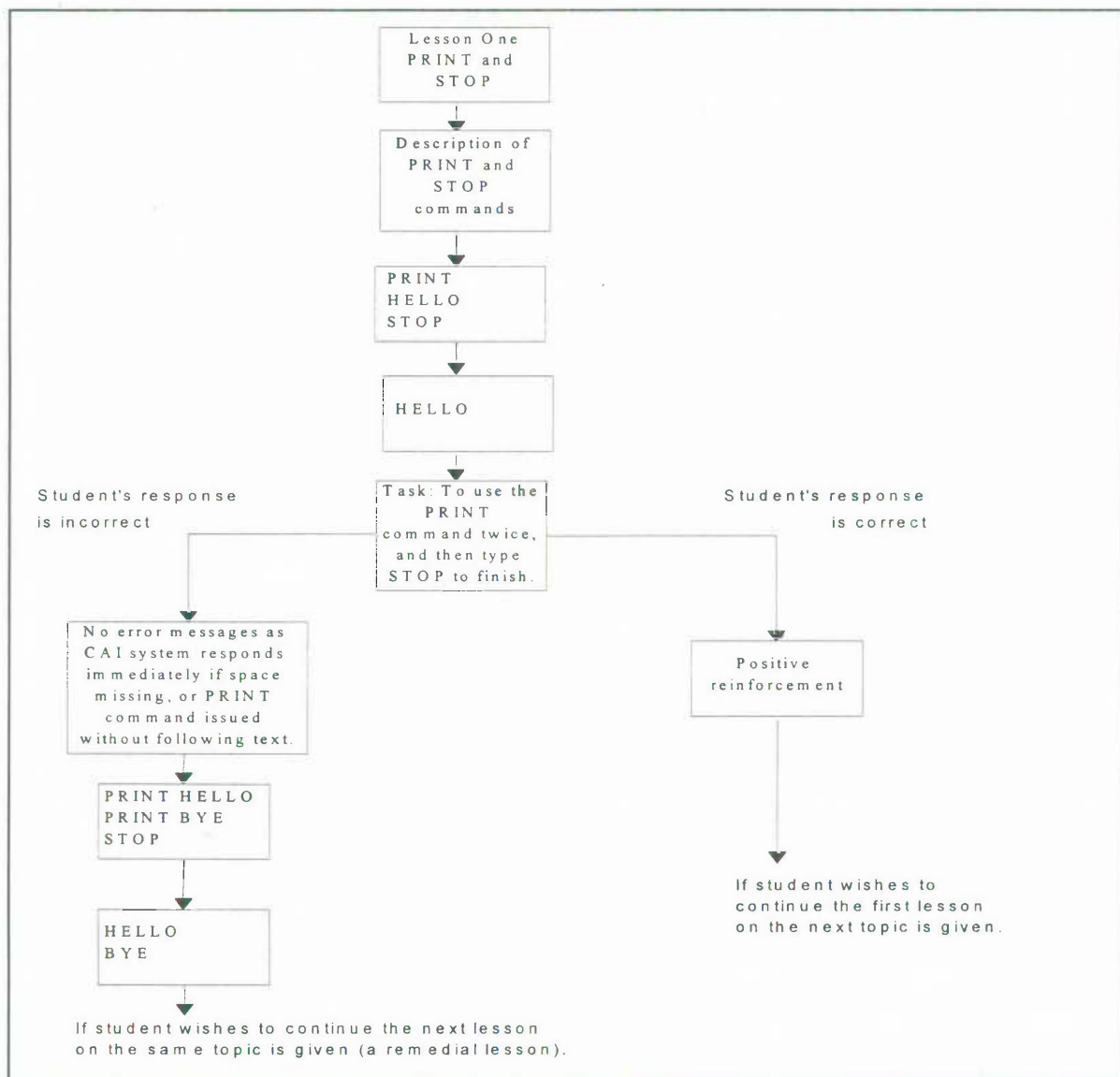


Figure C1: Case Study One : Lesson One

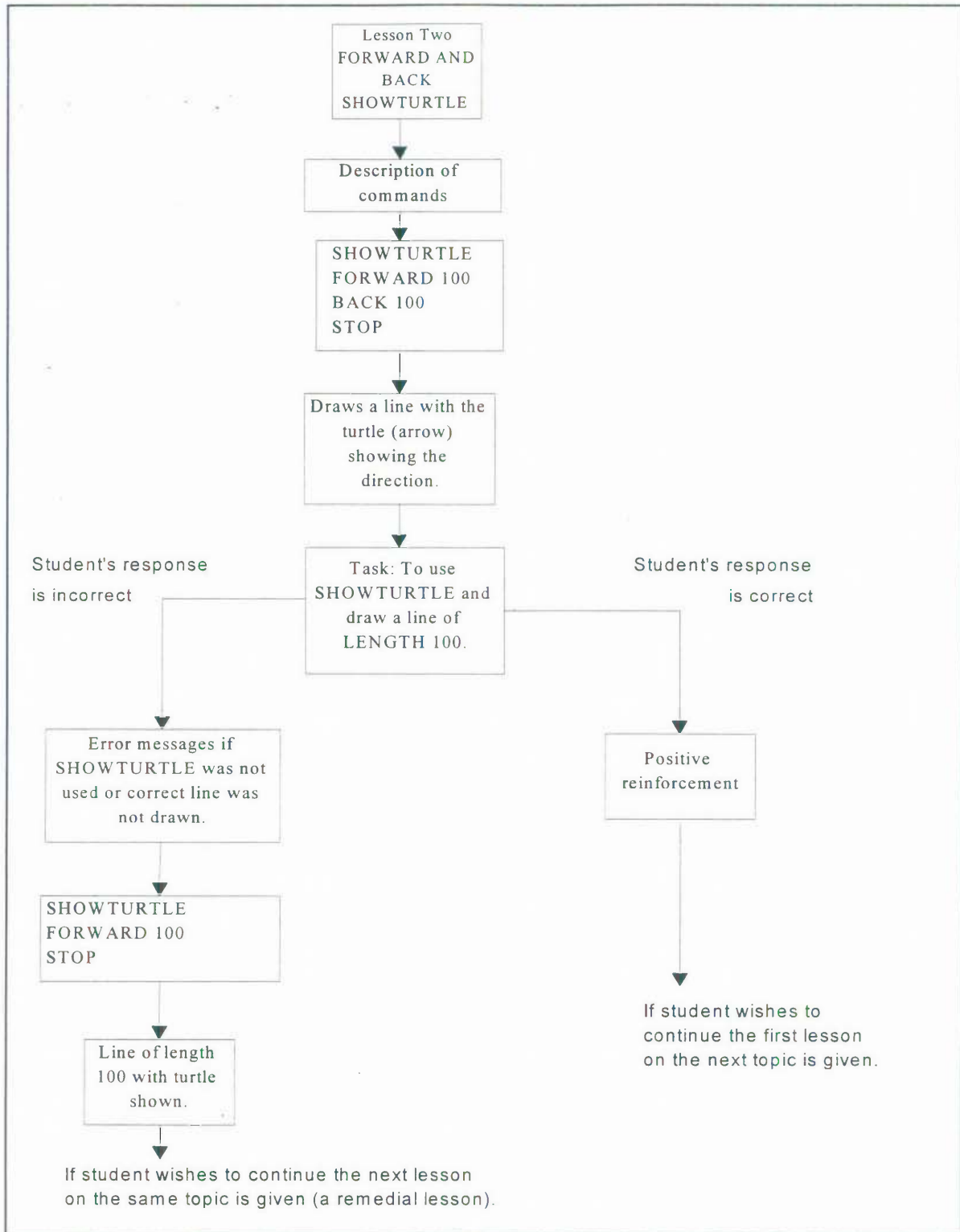


Figure C2: Case Study One : Lesson Two

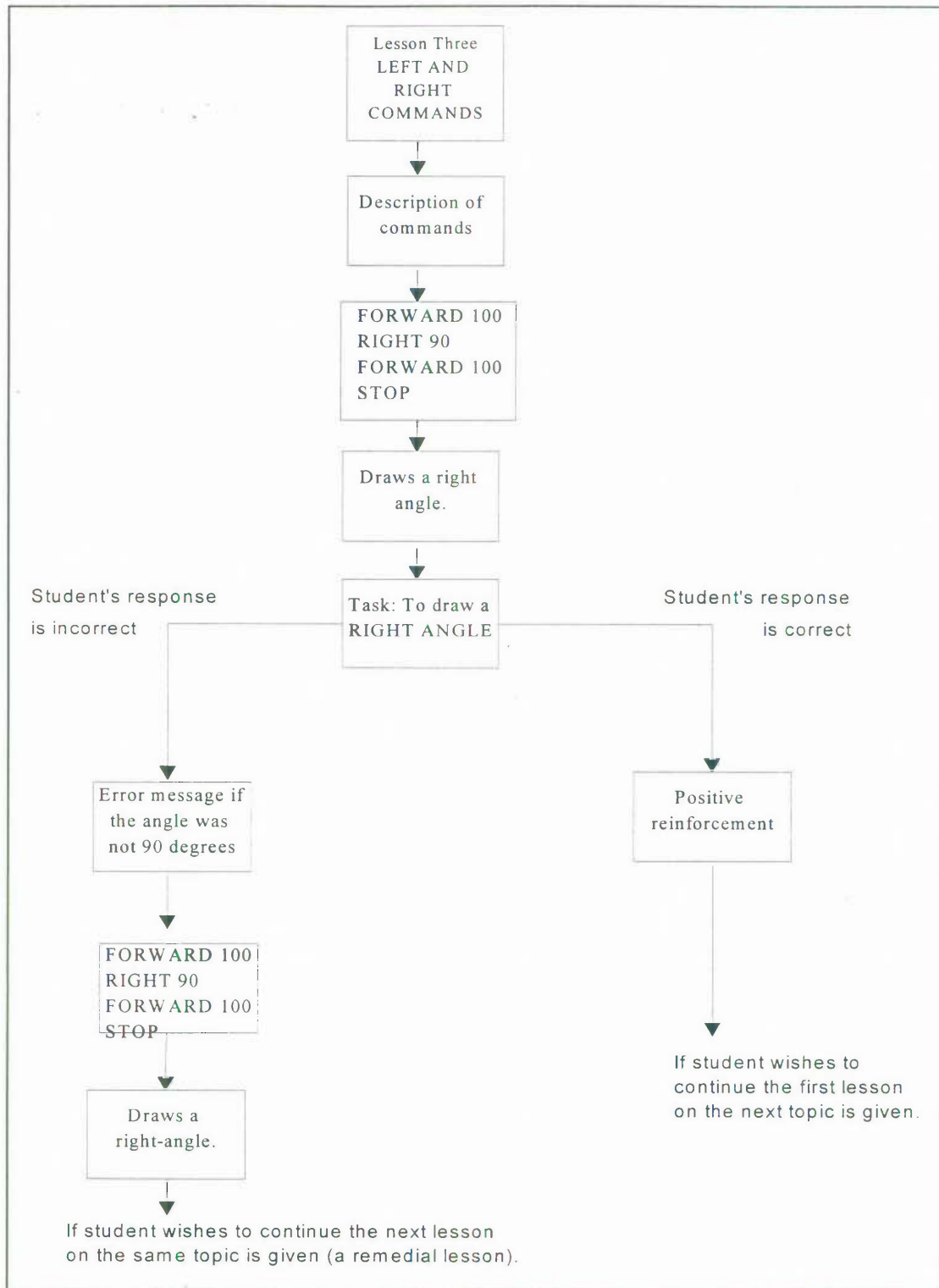


Figure C3: Case Study One : Lesson Three



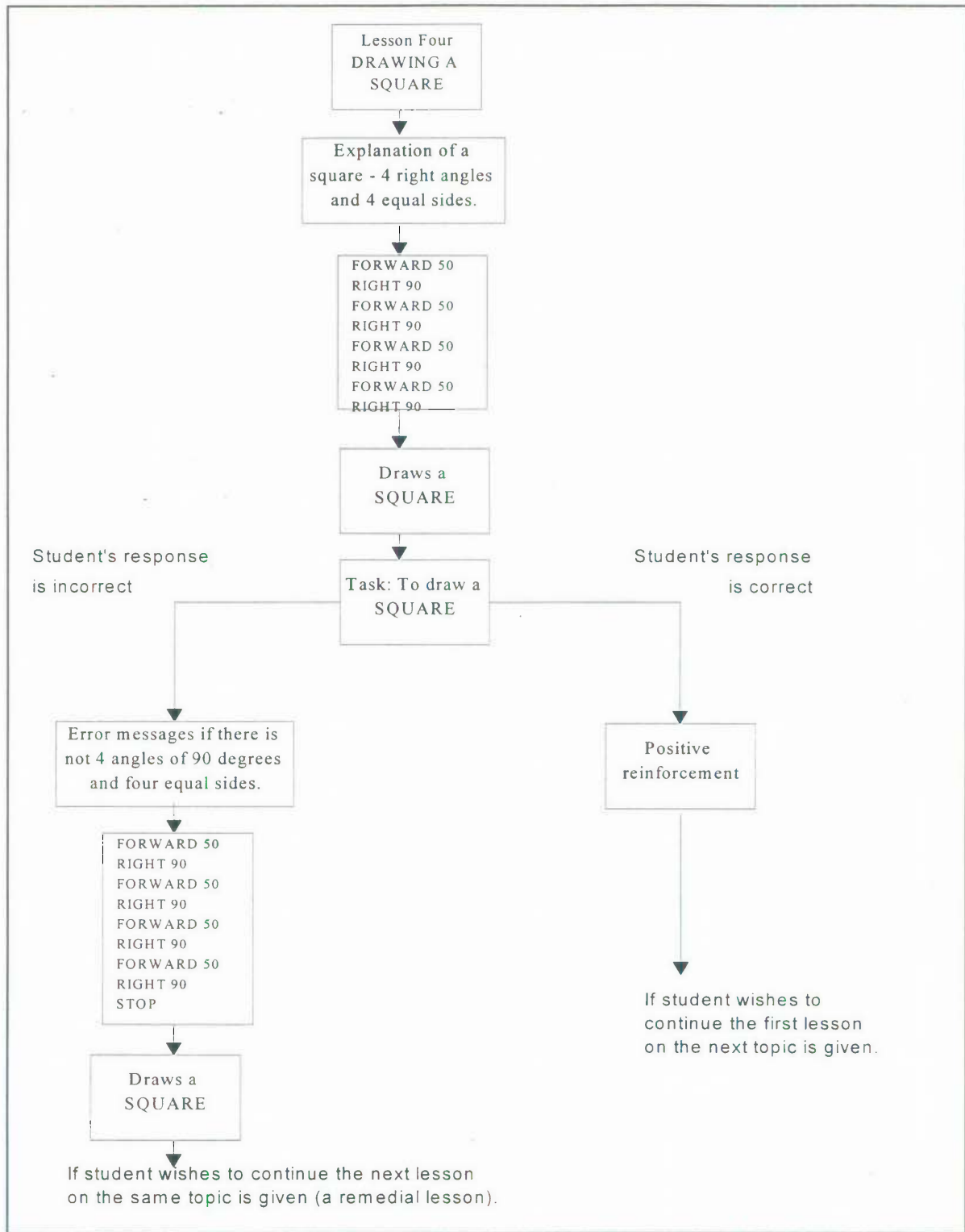


Figure C4: Case Study One : Lesson Four