

Making Construals as a New Literacy?

Meurig Beynon
Jonathan Foss
Elizabeth Hudnott
and the CONSTRUIT! project team

The CONSTRUIT! project: EU Erasmus+ 2014-2017



construit.org
jseden.dcs.warwick.ac.uk/construit.c3

Erasmus+ This project has been funded with support from the European Commission under the Erasmus+ programme (2014-1-UK01-KA200-003818). This presentation reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

10/25/2016

ITAG 2016

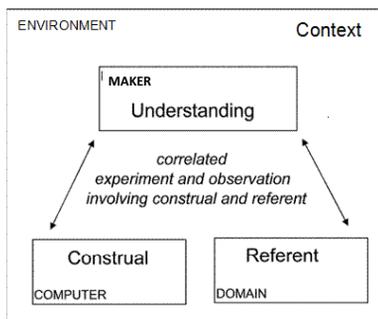
1

26/04/2016

Warwick University TEL Forum

2

Making construals as making connections ...

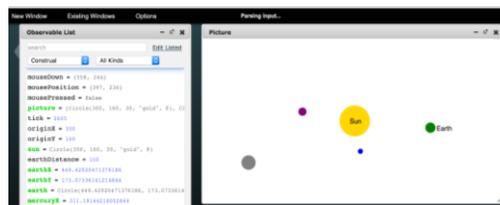


26/04/2016

Warwick University TEL Forum

3

A solar system construal



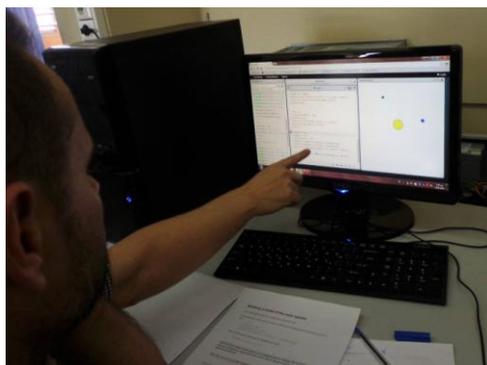
The basic form of the solar system construal

c2/solar in the project repository at jseden.dcs.warwick.ac.uk/construit.c15

10/25/2016

ITAG 2016

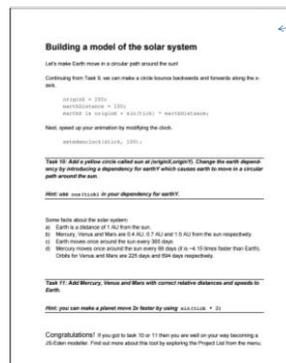
4



10/25/2016

ITAG 2016

5



Printed worksheet



Input window

10/25/2016

ITAG 2016

6

Group A	Group C
<pre> # 376 120 a = sqrt(120); # 376 430 b = sqrt(144); # 376 310 c = sqrt(a*a) + sqrt(b*b); # 376 170 d = sqrt(a*a+b*b); </pre>	<pre> # 376 120 # la sqrt(a^2 + b^2); # --- # 376 80 LineC la Line(100, 50, 100+10*a, 50); # 376 360 LineC la sqrt(LinA^2 + LinB^2); # 376 380 LineC la sqrt(LinA^2 + LinB^2); # 376 390 LineC la sqrt(LinA^2 + LinB^2); # 376 410 LineC la sqrt(LinA^2 + LinB^2); # 376 430 LineC la sqrt(LinA^2 + LinB^2); # 376 450 LineC la Line(100, 50, 100, 130); # 376 470 LineC la Line(100, 50, 100+10*a, 50); # 376 490 LineC la Line(100, 50, 100+10*a, 50); # 376 510 LineC la Line(100, 50+10*b)^2 + (100+10*a ... 50)^2; # --- # 376 530 LineC la Line(100, 50+10*b, 100+10*a, 50); </pre>
Group B	
<pre> # 376 330 a = 3; # 376 470 b = 4; # 376 490 (INCORRECT) c = 0 * 0; # 376 280 d = a+b; # 376 300 (INCORRECT) c = a*b; # 376 320 (INCORRECT) c = a*a+b*b; # 376 170 c = sqrt(a * a + b * b); </pre>	

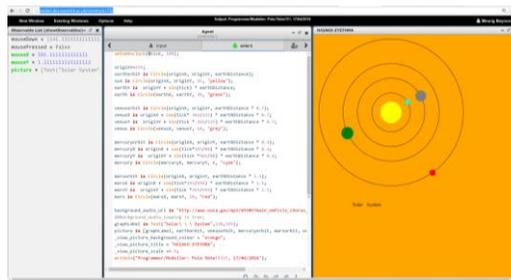
Figure 6. Three interaction extracts that demonstrate the difficulty faced by the students in applying Pythagoras's theorem.

Retracing pupil interactions as-if live

A: misunderstanding Pythagoras's theorem

B: misrepresenting Pythagoras's theorem in JS-Eden

C: a misconception about how Pythagoras's theorem relates to drawing triangles in JS-Eden



As adapted by a teacher at the workshop

10/25/2016

ITAG 2016

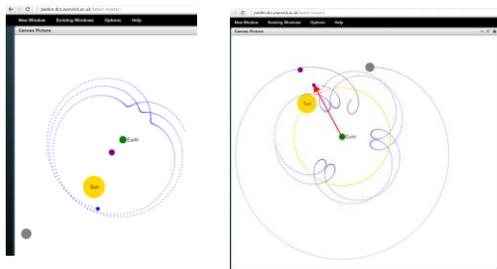
7

10/25/2016

ITAG 2016

8

A solar system construal



As elaborated to address matters arising

10/25/2016

ITAG 2016

9

10/25/2016

ITAG 2016

10

Emma King (a learning technologist's summary

Rigid programming does not allow you to see how a learner got to their finished program, however construals are designed to let you see the learning journey that students took to reach that final stage. Using technology based on making construals offers a unique opportunity to support the dialogue around assessment and learning.

Teacher Feedback April 2016

Please let me put in words my impression based on my 2-days contact with construals and talks with teachers who took part in that workshop. It seems that the term construals is not clear enough to our "preinstalled" brains with old software. We - as teachers - need a toolkit to start with a new project, a good practice experience. We have to be convinced that it deserves the effort and feel familiar with the new "product". The way a teacher will build "his own construals" requires high skills in programming and an alternative perception of showing/explain a phenomenon. It's too much work for an hour of lesson. We are not used to unlearn, to give a chance to different, to experiment ... In my opinion, you need teachers-scientists in STEAM to act as creators, makers and storytellers to lead construals to teachers. ... [The way you consider to redirect construals seems to me closer to reality. ...]

Stavroura Mishou, July 2016

10/25/2016

ITAG 2016

11

