Investigation of student engagement with programming in TU100

The impact of using a graphical programming environment?

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Agenda

- Motivation

- Project's aims

- Methodology

- Our findings

- Summary & future work

Motivation

- There is a strong need for the teaching of introductory programming at level 1 in the Computing and IT degree programme.

- The majority of new OU students will not have experienced the new National Curriculum.

- Previous teaching of programming at level 1 (M150) involved a text-based programming, JavaScript.
  - Over half of students avoided answering the question on programming in the EMA.

- TU100 '*My digital life'* uses a graphical programming environment *Sense* based on Scratch.

Project's aim

- The aim of this eSTEeM project is to investigate the impact of using a graphical programming environment on student engagement with programming.

    – It will seek to address the fundamental question as to whether the visual programming environment actually engages novice programmers or not in '*TU100*'.
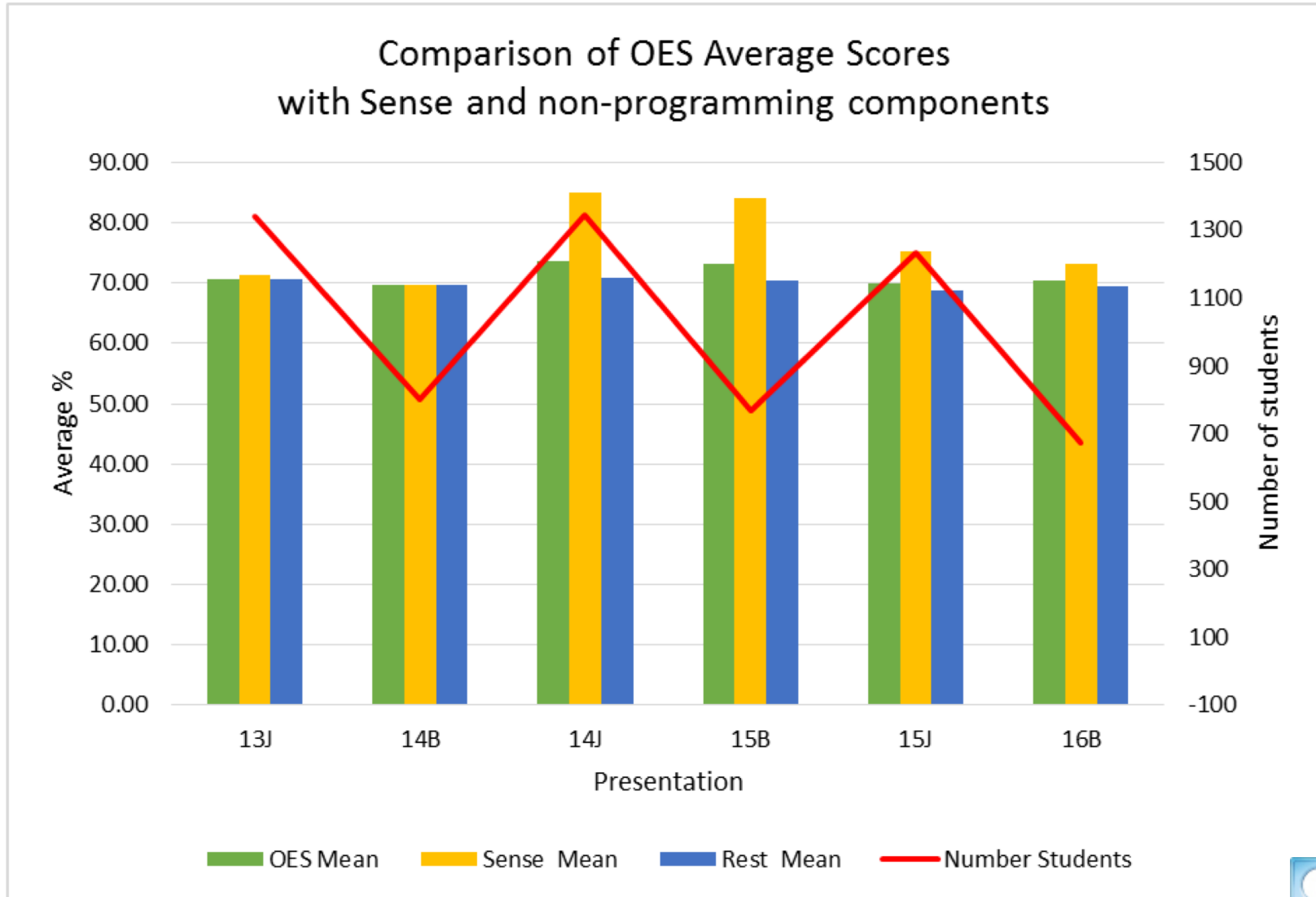
Methodology

- Identification of the Sense programming questions in each TMA and in the EMA.

- Identification and collection of data related to the numbers or students who completed these questions and their overall performance.

- Analysis of textual comments in a selection of SEaM surveys of TU100 relating to students' experience of programming.
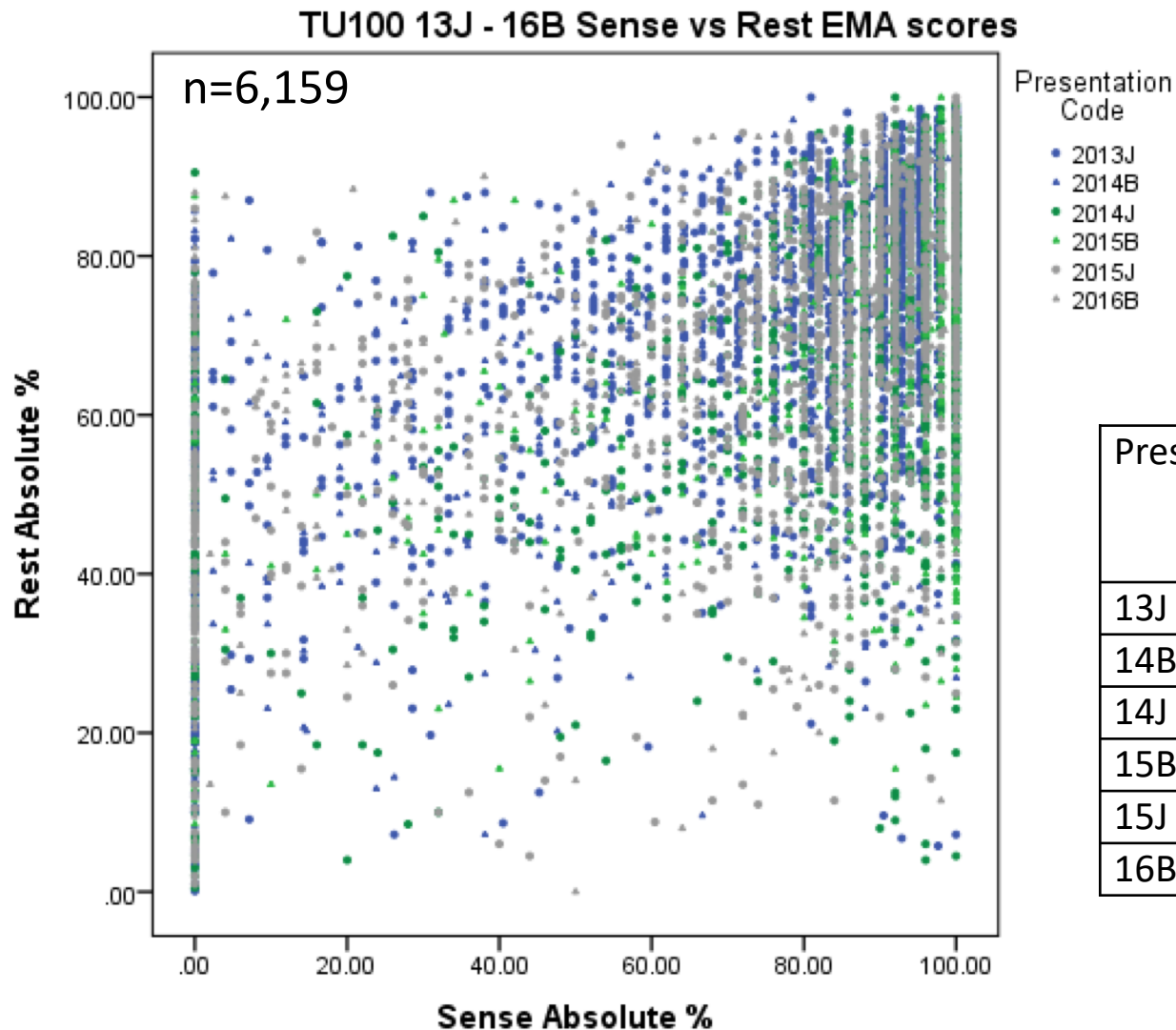
Comparison of OES Scores

Presentation	No. of Students	OES		Sense		Rest	
		Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
13J	1340	70.66	74.40	71.32	80.33	70.52	74.52
14B	801	69.62	74.19	69.64	83.33	69.63	74.52
14J	1343	73.63	78.80	85.00	94.00	70.79	75.50
15B	767	73.19	78.00	84.10	96.00	70.46	74.50
15J	1234	70.03	74.80	75.14	86.00	68.75	73.00
16B	674	70.28	74.80	73.26	85.62	69.54	73.50

Comparison of OES Scores

Comparison of OES Average Scores with Sense and non-programming components

Correlation between Sense and Non-programming scores.

TU100 13J - 16B Sense vs Rest EMA scores

n=6,159

Presentation	Correlation (In all cases p =0.00)
13J	.569
14B	.602
14J	.522
15B	.512
15J	.551
16B	.555

Are Students passing without passing Sense?

OES for Students that scored <40% on Sense

<7.5%
(460 out of 6,159 students)
failed Sense and passed OES

	<40	40-50	50-60	60-70	70-80
■ No. Students	356	181	161	88	30

OES %

The Open University
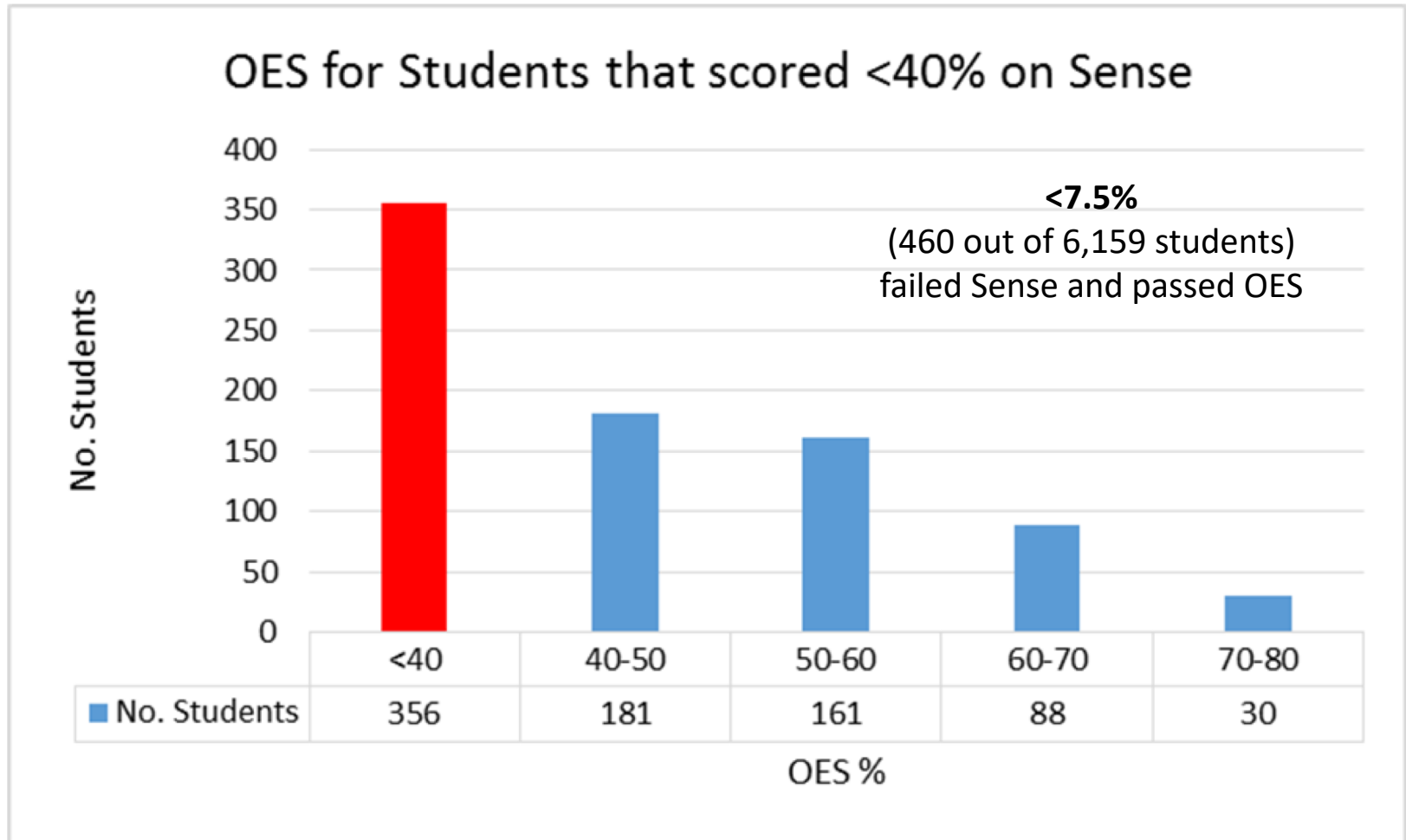
Summary & Future Work

- ## Summary
  - More students have engaged with the programming element than on previous modules.
  - There is a strong correlation between the scores that students achieved in the programming and non-programming elements of the EMA.
  - There is little or no difference in the performance of students in the programming elements and the non-programming elements.

- ## Future Work
  - Analysis of SEaM surveys' textual comments relating to students' experience of programming.
  - Investigation of whether there is improved students engagement with programming comparing to M150