An Interesting Relationship

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While examining the relationship between the average TP2 to TP5 scores and the Post Test Scores, it was noted that the post test scores usually lay a little above the average Topic plan scores. This is dependent on all the scores having been normalized on the basis that the student with the highest score in each of the Topic plans and the post test was assumed to have a score of 1. However, the scores of some students - some of them with fairly good Topic plan scores - did not follow this general pattern. One explanation of this was that these students did not have good inferencing ability so that even though they may have been successful in the small increments of difficulty reflected by the nature of the questions in the Topic plan, they were unable to extrapolate that to the post test due to poor inferencing ability. To test this explanation, an inference measure was used to compare these students performance. This was readily available in the previously categorized post test scores in terms of observation, calculation, inference and reporting. These results are reported in this article.

1 The data

The raw results from Topic plans 2 to 5 which were on a scale of 0 to 1 were recalculated on the basis that the student with the highest score in that specific Topic plan was assumed to have a score of 1. The same was done with the post test results.

Stud ID	TP2	TP3	TP4	TP5
1	0.68	0.55	0.74	0.87
2	0.88	0.84	0.80	0.89
3	0.54	0.74	0.85	0.89
5	0.72	0.89	0.68	0.84
6	0.64	0.68	0.56	0.81
8	0.83	0.92	1.00	0.93
9	0.74	0.84	0.89	0.88
10	0.77	1.00	0.73	0.92
11	0.59	0.70	0.65	0.79
13	0.71	0.67	0.81	0.95
14	0.83	0.86	0.89	0.89
16	0.95	0.82	0.76	0.86
17	0.66	0.78	0.81	0.90
18	0.57	0.53	0.51	0.67
20		0.69	0.92	0.97
21	0.37	0.70	0.71	0.91
22	0.75	0.92	0.83	0.97
23	0.94	0.88	0.97	1.00
24	0.77	0.88	0.95	0.80
25	0.47	0.77	0.72	0.73
26	1.00	0.77	0.60	0.68
27	0.68	0.80	0.64	0.68

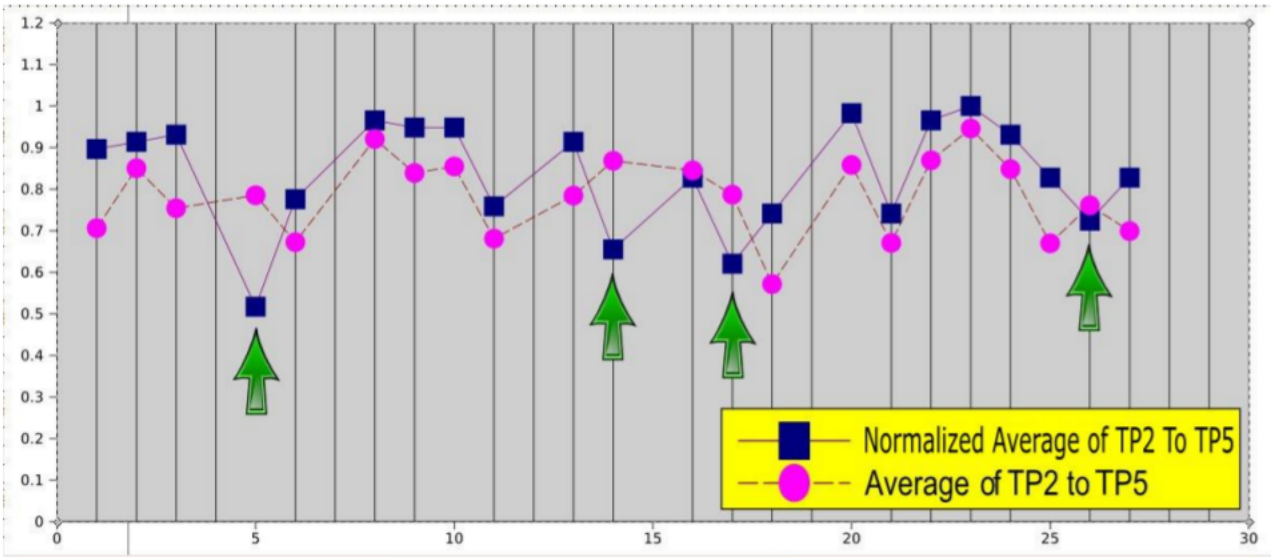
1.1 Observation

There is no consistency in the student who gets the highest score although Student 23 seems to be quite close to the upper end of the band in all four Topic plans. By contrast, Student 26 was generally a weak student who scored the highest in TP2.

2 The comparison

When the difference between the average of the normalized TP scores are compared to the normalized Post Test scores we can see that the general pattern is for the Post Test Scores to be higher than the TP average scores. This could be explained by saying that there is a compression in the Post Test Scores resulting from the learnings of the Topic plans. In other words, the difference in scores between the strongest and weakest students has got less. This has been demonstrated across the Topic plans 2 to 5 where a gradually decreasing gap is discernible between the highest and lowest scores.

However, Students 5,14,17, and 26 seem to break this pattern in the order of intensity of deviation. This is more explicitly visible in the Figure below:



One explanation could be that these children have relatively poor inferencing ability and were therefore unable to extrapolate their success in the Topic plans to the post-test.

To test this explanation we provide below the analysis of the post test questions which have been categorized into classes of ability needed to answer those. These abilities were identified at the start of the course and some of the analysis has been focused on the change in these abilities. These abilities were identified as:

Calculation: the ability to calculate mentally

Inference: the ability to apply existing knowledge in new circumstances

Observation: the ability to record observations largely in terms of numerical values

Reporting: the ability to represent mathematical outcomes

Average - Result	QuestionType				
StudNo	Calc	Inference	Obs	Reporting	Total Result
1	0.92	0.64	1.00	0.86	0.80
2	0.96	0.68	1.00	0.71	0.82
3	1.00	0.68	1.00	0.71	0.83
5	0.50	0.43	0.50	0.43	0.46
6	0.67	0.61	1.00	0.86	0.69
8	0.96	0.75	1.00	0.86	0.86
9	0.88	0.79	1.00	0.86	0.85
10	0.83	0.86	1.00	0.71	0.85
11	0.75	0.57	1.00	0.57	0.68
13	0.96	0.68	0.83	0.86	0.82
14	0.75	0.50	0.33	0.57	0.58
16	0.83	0.64	1.00	0.57	0.74
17	0.62	0.57	0.17	0.57	0.55
18	0.67	0.64	0.83	0.57	0.66
20	0.96	0.82	0.83	0.86	0.88
21	0.62	0.64	0.83	0.71	0.66
22	1.00	0.75	0.83	0.86	0.86
23	1.00	0.79	1.00	0.86	0.89
24	0.96	0.68	1.00	0.86	0.83
25	0.75	0.71	1.00	0.57	0.74
26	0.83	0.46	0.83	0.57	0.65
27	0.92	0.61	0.83	0.57	0.74
Total Result	0.83	0.66	0.86	0.71	0.75

We find from this that students 5, 14,17 and 26 represent the lowest results for inference with Student 5 having the lowest which is consistent with the greatest difference in the figure above. Student 16 has relatively low scores but is not in the lowest band.

Hence, it would seem that the growth of inferential ability is not consistent across the students - as is to be expected - but it is surprising that there is such a strong correlation between inferential capability and post test scores.