

The struggles of the lower-scoring students

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Abstract

Nuthall's exceptional quantitative and qualitative analyses provide us with an illuminating picture of the cognitive and emotional struggles of low-scoring students. His poignant portrayals leave us to consider the types of classroom modifications and settings that will best help these students. The second section explores some apparent differences between Nuthall's finding that the need for four spaced encounters applies to all students and the older research on individual differences in the rate at which students learn new material.

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1. Introduction

Most research on teaching has focused on the teacher. But the pioneering work of Graham Nuthall and Adrienne Alton-Lee (1992a, 1992b) focuses primarily upon the students. Through the use of microphones, video cameras, and interviews with the students they were able to develop and present an extremely detailed description of the content and activities that students are exposed to and the settings in which this exposure occurs. The result is a fine-grained coding of each student's participation in tightly observed classroom activities—a detailed description of the way students learn.

With the help of the participating teachers, Nuthall and Alton-Lee (Alton-Lee & Nuthall, 1992a, 1992b; Nuthall & Alton-Lee, 1993) also developed an exceedingly fine-grained test of the content that was taught in each unit. They administered this test to the students before

instruction began, 2 weeks after the instruction ended, and again, 12 months later. This testing enabled them to learn when and whether the observed student learned new material and whether the new material was retained 12 months later. And through their methods, each test item could be related to the student classroom activities that occurred while that material was being taught.

Each of the studies consisted of a detailed analysis of the experiences of a selected number of students through the course of a naturally occurring curriculum unit classrooms (for 10–12 year old students). The units were designed by the teacher. Nuthall and Alton-Lee, or Nuthall alone, after Alton-Lee moved to a new position at Victoria University of Wellington, identified 4–6 students in each class who represented differences in prior achievement, gender, and ethnic origin. The measure of prior achievement was the average age-related percentile on at least three school-administered achievement tests, including reading comprehension. The experiences of these students were continuously observed and recorded throughout the unit. The identities of

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the students were not known to the teacher or the students until after the unit was completed (Nuthall, 2000a, p. 254).

Nuthall and Alton-Lee analyzed this data and attempted to determine how and when individual students learned or failed to learn specific items of content from their classroom experiences. No researcher before them has equaled this comprehensive empirical and qualitative approach to the study of classroom learning.

2. Quantitative results

Table 1 is a summary of the findings for four of the studies as reported in Nuthall and Alton-Lee (1993) and Nuthall (2000a). The results for the pre-test are presented in the first column. As we see, the students varied in their knowledge of each topic even before the instruction began. All students took the same pre-test as a post-test as the end of the unit. The percent of initially unknown items that were learned by each student, that is, material that they did not know on the pre-test, is presented in Column 4. Nuthall (1999a) reported a .38 correlation between the number of test items a student

knew before the unit began and the percentage of unknown items that the student learned during the unit. In other words, the more material that a student knew at the start of the unit, the more a student learned during the unit.

Column 5 of Table 1, gives the prior-achievement percentile for each student. This score is the average percentile score for each student on a composite of three achievement and aptitude tests. Nuthall correlated the scores in Column 4, the percentage of unknown material that students learned during each unit, with the scores in Column 5 and obtained a correlation of .72. In other words, the students with the highest prior achievement scores learned the highest percentage of new material in these units. Indeed, the results for Studies 2, 4, and 5 show perfect rank-order correlations between entering achievement scores (Column 5) and the amount of new material that was learned (Column 4). In Nuthall's words (1999a), "the lower the average percentile score, the lower the amount learned (p. 218)."

As Nuthall (1999a) wrote, "While the learning process is the same for all students, low-ability students are prevented from using opportunities, or do not make use of, or create as many opportunities

Table 1
Percent of new concepts learned and average achievement percentile for students in Studies 2, 3, 4, and 6

	1 Number of concepts not known at start of lesson	2 Number of concepts learned	3 Number of concepts not learned	4 Percent learned	5 Average achievement percentile
Study 2					
Amy	72	55	17	76	93
Kim	70	43	27	61	30
Sam	76	37	39	49	14
Study 3					
Jon	17	12	3	71	97
Mia	43	28	15	65	96
Joe	31	18	13	58	55
Ann	40	20	29	50	55
Study 4					
Jan	22	10	12	45	70
Rata	37	17	20	46	68
Pam	42	16	27	37	21
Tui	47	14	33	30	11
Study 6					
Paul	103	74	31	51	89
Jane	117	65	52	48	83
Joy	116	61	55	43	70
Jim	115	62	53	37	56
Teine	130	41	89	27	34

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