DISCOVERY-BASED LEARNING

David Clark in a paper entitled "R.L. Moore and the Learning Curve" and published by the Educational Advancement Foundation has offered the following comparison between discovery-based teaching and information-based teaching.

"In discovery-based teaching it is the role of the instructor to pose appropriate questions at the right time, and to direct students to activities in which their efforts will result in effective learning. It is the role of the students to figure out and articulate the answers, and to fully engage in those learning activities. In information-based teaching it is the role of the instructor to give a clear and entertaining exposition of the relevant information. It is the role of the students to absorb this information and then to pass exams which demonstrate that they have done so."

In modern times, R. L. Moore has undoubtedly been the most successful user of the discovery method of teaching. He taught for a total of sixty-four years, forty-nine of them at the University of Texas. The achievements of his students are remarkable, most likely unsurpassed. Moore and three of his students all served terms as President of the AMS. Three other students served as Vice President of the same organization. Five of his students became President of the Mathematical Association of America. Moreover, Moore and three of his students were elected to membership in the national Academy of Science. By 1983, Moore had placed more students into the National Academy of Sciences than any other professor in the nation. In 1930, the Council of the American Mathematical Society named R. L. Moore to be the first American to serve as its visiting Lecturer. In the 1967, the American Mathematical Monthly released the results of a national survey giving the average number of publications of doctorates in mathematics that had graduated between 1950 and 1959. By the way, Moore was 77 in 1959, well beyond the normal retirement age in this country. The Universities with the highest rates of scholarly production for their recent graduates were Tulane, Harvard, and the University of Chicago in that order. Tulane graduates had on the average produced 6.3 publications per doctorate, Harvard graduates averaged 5.44, and doctorates from the University of Chicago averaged 4.96 publications. At the University of Texas, R. L. Moore's graduates for that period had produced a whopping average of 7.1 publications per person. Something about the Moore Method had worked very well. Those benefiting from this form of teaching have not been limited to research mathematicians. A number of successful people from a variety of professions have attributed some, if not a major portion, of their successes to the training they received in a discovery-based environment.

Today, the Education Advancement Foundation has made significant progress in reintroducing the discovery method of teaching in Mathematics as well as in other fields. I will attempt to convey to the audience some of the history, experiences, techniques, and successes of the method. I expect to have supporting materials from the EAF available at the meeting.

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