

THE RELATIONSHIPS AMONG INTEGRATED SCIENCE PROCESS SKILLS, LOGICAL THINKING ABILITIES, AND SCIENCE ACHIEVEMENT AMONG RURAL STUDENTS OF SABAH, MALAYSIA

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Abstract

Science curriculum in Malaysia gives conscious emphasis on the acquisition of scientific skills and thinking skills, the inculcation of scientific attitudes and nobles values besides the acquisition of scientific and technological knowledge and its application to the natural phenomena and students' daily experiences. The purpose of this study is to gauge the acquisition of integrated science process skills, logical thinking abilities and science achievement among Form 4 students in the Interior Division of Sabah, Malaysia. This study is also aimed to determine whether there is a significant difference in the acquisition of integrated science process skills, logical thinking abilities, and science achievement between male and female secondary students in the Interior Division of Sabah, Malaysia. The ultimate goal of this study is to investigate whether integrated science process skills and logical thinking abilities can predict rural secondary students' science achievement. This is a non-experimental quantitative research and sample survey method was used to collect data. Research samples were selected by using a two-stage cluster random sampling technique. Instruments namely Integrated Science Process Skills Test (ISPST), Group Assessment of Logical Thinking Abilities (GALT), and Science Achievement Test (SAT) were adopted to investigate the possible linear relationships among rural secondary students' integrated science process skills, logical thinking abilities and science achievement. Five subscales of integrated science process skills measured in this study were 'Identifying variables', 'Identifying and stating hypothesis', 'Defining operationally', 'Designing investigations', and 'Graphing and interpreting data' whereas six modes of logical thinking abilities measured were 'Conservational reasoning', 'Proportional reasoning', 'Controlling variables', 'Combinatorial reasoning', 'Probabilistic reasoning', and 'Correlational reasoning'. Students' science achievement in Elementary Biology, Elementary Chemistry and Elementary Physics were also measured in this study. Parametric tests namely Independent samples *t*-test, Pearson's product moment correlation, simple and multiple regression analysis were used to test the stated null hypotheses at a specified significance level of .05. Quantitative data was analyzed by using the Statistical Packages for Social Sciences (SPSS) and QUEST. The research findings will bring some meaningful implications to those who are directly or indirectly involved in the development and implementation of science curriculum especially in the Interior Division of Sabah, Malaysia.

Background of the Study

The progressiveness of a nation is very much dependent on the generation of new ideas which will act as a catalyst to the development of the nation. In an effort to achieve the status of a developed nation, the Malaysian government had initiated and documented a vision to be achieved by the year 2020. Among the nine strategic challenges identified, the sixth strategic challenge is to establish a scientific and progressive society, a society that is innovative and forward-looking, one that is not only a consumer of technology but also a contributor to the scientific and technological civilization of the future (Wan Mohd. Zahid, 1993). The core of this vision requires Malaysians to possess high scientific and technological skills to enable the people to be involved directly and indirectly in the up-stream and down-stream of science and technology activities.

The most fundamental and powerful human resource is intelligence where it is important not only to have a good brain but also to have the ability to use it and to ensure it is functioning effectively. In relation to this, science has prepared ways which enable us to think logically about our daily events and practical problem