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Examining Normal Academic/Technical Students' Science Learning from a Sociological and Cultural Lens

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KEY IMPLICATIONS

- Schools and teachers could work on providing social capital to complement the cultural capital of students in science learning.
- More emphasis is needed on developing Secondary 1 Normal Academic (NA) and Normal Technical (NT) students' science inference skills.

BACKGROUND

There was a dearth of empirical science education studies on NA and NT classrooms/students. The existing literature tends to embody deficit views about lower progress groups.

FOCUS OF STUDY

This study examined how Singapore NA and NT lower secondary school students' experienced their science education from a cultural and sociological lens.

KEY FINDINGS

- Students generally enjoyed science lessons but did not wish for more.
- The majority of the curriculum time was not spent on disciplining students.
- Most students would not consider a post-secondary education or career in science.
- Macro-structures (e.g., streaming policy), meso-structures (e.g., physical and sociocultural) and micro-structures (e.g., the lack of clarity or inconsistency of rules and expectations) shaped NA and NT science classrooms.
- Students generally had less access to cultural capital but their social capital was also not very strong.
- There was significant negative growth in Secondary 1 NA and NT students' science inference skills over the year 2014.
- Predictors of Secondary 1 NA students' science inference skills were: (a) self-views in science learning, and (b) views about the nature of science.
- A predictor of Secondary 1 NT students' science inference skills was their views about their science teacher.

SIGNIFICANCE OF FINDINGS

Implications for practice

More emphasis on developing Secondary 1 NA and NT students' science inference skill is needed in the curriculum.

Implications for Policy and Research

The nature of science may be incorporated into the Secondary 1 NA science curriculum. More large-scale studies of similar quantitative

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research design may be carried out to inform policy and/or curriculum changes.

Learning Gains

Future research on intervention strategies focusing on the predictors identified in this study may be carried out to see if they help to improve students' science inference skills.

Proposed Follow-up Activities

A new and ongoing follow-up study on subcultures of NA science classrooms is being funded to develop deeper insights into the workings in the context of interest.

PARTICIPANTS

In 2014, a total of 39 schools, 4,582 Secondary 1 and 2 NA and NT students, 12 science teachers, 2 Heads of Department (HODs) for Science and 2 school principals participated in the study.

In 2015, one class of about 20 students, 1 science teacher and 1 Allied Educator participated in the study.

RESEARCH DESIGN

The research design comprised of a quantitative and qualitative component. A total of 4,582 students from Secondary 1 and 2 NA and NT students completed 3 science inference tests and 1 student survey in 2014. A total of 8 (one Secondary 1 NA, Secondary 1 NT, Secondary 2 NA and Secondary 2 NT) science classes from 2 schools were observed and videoed. Students, teachers, HODs for Science, and principals were interviews to obtained deeper insights into the science classrooms.

About the authors

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Request for more details

Please approach the Office of Education Research, National Institute of Education, Singapore to obtain a copy of the final report.