Title: Investigating the approaches to learning and studying of tertiary students in Singapore: A longitudinal study

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than a collection of facts, rules, algorithms and procedures to be memorised, then it would not be surprising if the learner tends to apply these by rote and hence cannot think scientifically.

**Reasons associated with the curriculum**

Among the reasons related to curriculum is the heavily loaded syllabus or loaded timetable. This could then mean that there might not be adequate opportunities to allow students to internalise concepts gradually, which could result in poor long-term memory retention. In order to handle a high volume of information, some students tend to adopt surface learning strategies (i.e. rote memorisation), rather than seeking meaningful linkages. Another reason relates to the inadequate description of the nature of science in the curricular materials; also the presentation of the content in the form of independent, disjointed topics, which tends to encourage students to compartmentalise topics, hindering the understanding of generic concepts, principles and models across topics. It has concluded that no single factor operates alone. Instead, a variety of these factors operate in concert to result in students' lack of scientific thinking ability.

**Research published in:**


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**Investigating the Approaches to Learning and Studying of Tertiary Students in Singapore – A Longitudinal Study**

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The purpose and objectives of this study are:

1. To chart the studying and learning patterns of tertiary students in Singapore and compare them with those used by overseas students.

2. To identify and study factors that affect the studying and learning process and products of learning so as to promote deep studying and learning approaches.

3. To validate the Biggs' Study Process Questionnaire for local use.

This is a multidisciplinary research project encompassing representatives from all the tertiary institutions in Singapore. The following are members of the research team:

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The project started in April 1996, when permission was granted by John Biggs to use his Study Process Questionnaire (SPQ) scale in the local context. An initial pilot study showed that students here had no difficulties answering the 42 items in the scale. Minor modifications were made to the scale. Local validation in terms of using exploratory and confirmatory factor analysis procedures indicated that the six-factor model was identified, although a four-factor model was more parsimonious. Reliability estimates for all the subscales are generally high and compare very favourably with those reported overseas; Two papers were presented at the 1997 ERA conference, reporting on the validation studies carried out with the NIE and NTU Engineering samples. In addition, the papers also compared the different studying and learning approaches that students in NIE and NTU adopt with those students in Hong Kong and Australia. Generally the students here, specially those at NIE, adopted the deep approach more than the surface and achieving approaches (Poh, S.H., Mau, R., Quek, K.S. & Cheng, Y.S., 1997; Poh, S.H., Ng, Y.K. & Yan, Y.K., Proceedings. ERA 1997).

NIE students were followed up during subsequent semesters in NIE to further chart the pattern of their studying and learning approaches over time. The longitudinal comparisons over the two semesters showed that the Post-Graduate Diploma in Education (PGDE) students demonstrated significant increases in deep as well as surface approaches, while the achieving approach showed a slight drop. The Diploma in Education (Dip Ed) students generally showed a slight drop in all the three approaches when compared over the two years of study at NIE. Overall, the students in both the programmes adopted the deep approach more than the other two approaches. When probed further with focused interviews, the PGDE students mentioned that the teaching and learning process, the assessment mode in the modules and the learning environment, all contributed to their approaches to learning and studying. Results from this longitudinal study were reported at the ERA 1998 conference (Poh, S.H., Mau, R., Cheng, Y.S., Yan, Y.K. & Quek, K.S., 1999).

This study has validated the Biggs’ SPQ for local use. A considerable database has been established of the studying and learning approaches of the NIE students and some other tertiary students in Singapore. The next phase will involve collecting data on the performance of students in other tertiary institutions in Singapore and continuing our research to chart as well as to find the relationship between the students’ approaches to studying and learning and their performance in their respective tertiary institutions.