

Using the Biggs' Study Process Questionnaire (SPQ) as a diagnostic tool to identify "at-risk" students – a Preliminary Study

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Abstract

This study explores the use of Biggs' Study Process Questionnaire (SPQ) as a diagnostic tool for identifying low-achieving and surface learners. Six groups of 1st year students were selected for this study; two groups were of high-ability, two groups of average ability and two groups of low-ability (classified using the G.C.E. 'O' Level Maths results). After the SPQ was administered, the survey data was processed and two types of report were generated:

- (a) a class profile report for each class tutor showing the approaches of his/her students;
- (b) a feedback report to each individual student explaining the characteristics of his/her approach, the outcomes of having such an approach and strategies on how to move to a deep+achieving approach.

Focused group interviews were conducted with the class tutors and students to find out if both parties found the reports helpful. For the tutors, whether intervention strategies such as counselling, teaching and learning methods, and the classroom environment could then be used to help the low-achieving and surface learners. For the students, whether the awareness of their approach and the recommended strategies helped them to modify or change their study methods.

Title:

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The Situation

The academic year in Ngee Ann Polytechnic is broken up into two 16-week semesters with a mid-semester break in week 8. Many modules require students to take a common test in week 9 as a learning progress indicator. The tests are graded in week 10 and the results are released to the students in week 11 or 12.

Students who fail more than one module are identified as being at risk of failing the semester, the result of which is to re-take the modules in the following semester, culminating in them taking longer than 3 years to complete the Diploma course.

These students are then counselled by the class tutor in the hope of motivating them to work harder. Academic intervention strategies such as peer tutoring and remedial classes are made available to the students. At the same time, letters are sent to their parents informing them of their child's performance on the common tests. This keeps the parents informed of the 'at-risk' status of their children and it is hoped that there will be home encouragement to spur these students on to improve their learning performance. By week 16, the semester is over and the students have to prepare to take on the year-end examinations.

The Problem

On reviewing the situation in the light of learning literature and theories, the researchers felt that, while the 'fear of failure' mentality in the system does to some extent prompt these 'at-risk' students to adopt strategies to avoid unnecessary repeating of modules, the measures may not help as much in improving the quality of learning, which in turn is affected by levels of motivation and students' learning styles and approaches. This 'fear of failure' appears to promote failure avoidance study tactics which tend to be more surface, short-term stop-gap efforts at just managing to help them clear the assessment check points and move on to the next semester. The deficit in learning usually still exists.

The researchers looked for an intervention tool that would better address the learning needs of the students.

The Intervention Tool

This study uses the Biggs Study Process Questionnaire (SPQ) as a diagnostic tool to identify the learning approaches of the students. The SPQ, a 42-item questionnaire, provides feedback on the learning approaches in the three domains, namely, the surface, deep and achieving domains which are further broken down into motives and strategies used. Surface motives are extrinsic such as fear of failing and surface strategies include reproductive or rote learning and "minimalistic" learning – learning that is just enough to meet the course demands. Such an approach often leads to poor academic performance.

The deep approaches, on the other hand, is about seeking to understand and relate understanding to other subjects and to develop personal meaning for subject material. However, a deep learner may sometimes wander off-track and not follow course syllabi and outlines. Academic performance, especially in a more structured system, may also be adversely affected.

An achieving approach is about maximising performance while optimising efforts to achieve it. These are strategic learners who may use surface or deep approaches, whichever that can help them to get high marks.

In order to facilitate the administration of the questionnaire, a web-based version of the questionnaire and automatic generation of the feedback to students and class profile report to tutors were developed.

The Research Questions

The researchers wanted to investigate whether the SPQ could be used as a friendly diagnostic tool to enable tutors to identify the at-risk students, and if it could, whether it would be an effective tool to help students develop and use strategies that would help improve the quality and depth of learning.

The researchers based the study on the following hypotheses:

- (1) that students identified as low-achieving and surface from the Biggs' SPQ are not academically successful;
- (2) that knowing their approaches to study is helpful to the students who want to improve;
- (3) that knowing students' approaches to studying is helpful to the tutors teaching them in that they can use appropriate teaching strategies that matches their learning approaches.

The Research Procedure

At the beginning of the semester, a meeting was arranged with a group of first-year tutors. During the meeting, the Biggs SPQ, research studies on the study approaches of students and their outcomes were explained to the tutors. The tutors were then asked to volunteer to participate in the study.

The tutors then informed the students in their classes about the Biggs' SPQ and that they will be visited by the researchers who will administer the SPQ during their mathematics tutorial classes which were chosen because the tutorials were computer-based. This happened during the third week of the semester. The researchers first explained the purpose of the study and emphasised the importance of responding truthfully to the questionnaire items to ensure the accuracy of a report they would receive telling them about their study approaches.

The students upon completion of the SPQ immediately received an on-line report of their study approaches, the outcomes of taking such approaches and strategies they could use for improvement (see Appendix1). As the Maths lab was not equipped with a printer, the

researchers printed the reports off-line and passed them to the respective class tutors for distribution to the students during their lessons with them.

The researchers also printed a class profile for each class and highlighted the low-achieving and surface students to the class tutor. The class tutors were asked to confirm if the class profile matched their perception of the students' learning behaviour.

The class tutors were then asked to go through the student report in class and counsel the at-risk students individually. They were also asked to monitor the progress of these students.

At the end of the semester, the researchers conducted focused group interviews with some of the students as well as a separate interview with the tutors. Also, the students' overall performance in the semester (using the weighted average of each student) was correlated with the SPQ data.

Preliminary Findings

This study is not complete in that the researchers up to this point in time have not been able to interview the tutors. Findings reported here come from the focused group interview with students, correlation of the SPQ with the students' weighted average, and some initial observations of the tutors.

(1) Initial observations of the tutors

The tutors were asked to compare the SPQ class profile report with their observation of the students. All the tutors reported that those classified as surface and low-achieving by the SPQ were observed to be weaker students in their Mathematics class.

(2) Focused Group Interview (students)

Upon invitation, eight students turned up for the interview. The SPQ profile of the eight students are as follows:

S/N	Student	Scores on SPQ			Compared with norms			Academic performance
		Surface	Deep	Achieving	Surface	Deep	Achieving	Weighted Average
1	Student A	22	59	52	--	++	+	96
2	Student B	54	63	62	+	++	++	73
3	Student C	59	65	66	++	++	++	52
4	Student D	69	68	69	++	++	++	73
5	Student E	62	51	47	++	+	0	60
6	Student F	51	47	47	+	0	0	68
7	Student G	49	44	38	0	0	-	73
8	Student H	36	19	31	-	--	--	66

In the group, there were 1 deep learner, 3 who are high on all three domains and 4 surface and low-achieving learners.

Some salient points that surfaced from the interview are:

- (1) All the students had no difficulty understanding the report on their study approaches.
- (2) They all agreed that the SPQ reflected quite accurately on the way they study.
- (3) Most of the low-achieving and surface learners quickly browsed through and did not give any attention to the recommended strategies provided in the report. They said it is change would be difficult because they “had been studying like this for the last sixteen years.”
- (4) One of the high achievers said he did not take up any of the strategies recommended because he has his own methods of studying and he knows his strengths and weaknesses.
- (5) Of important note is the feedback from the deep learner who said that the report was very helpful to him because he realised that to be more achieving, he has to become more focused on the course syllabi when reading widely.
- (6) The students who were found to be low-achieving and surface reported were either lacking interest in the course, or not having any strong like or dislike for the course or simply did not like the teaching method used (preferring practical classes to attending lectures).
- (7) The surface and low-achieving students were not confident of passing the exams – in fact, they worry that they may have to take supplementary exams. This is not so with the deep and high-achieving students.
- (8) Those very high on the surface scale felt that the pace of the lessons in the course very fast.
- (9) One student who scored very low on all three domains (and therefore likely to be ‘at-risk’) reported that despite having very good lecturers who were “beyond his expectations”, he was not motivated to take a deeper or more achieving approach to learning.
- (10) However, the other students, especially the four students (3 low-achieving and 1 high on all three domains) who reported that most of their lecturers were not approachable and even ‘sarcastic’, felt that having approachable and able-to-teach lecturers is key to helping them develop deep understanding of the subject matter.
- (11) Students who, regardless of their approaches, found lecturers unapproachable, resort to learning from their peers and the computer-assisted lessons, if any. On the other hand, students who have approachable lecturers preferred learning from these lecturers because “they are able to show more methods of solving a problem than the computer, sometimes short cuts.”

(3) Correlation of the SPQ approaches with the academic performance

Correlation of the scores on each of the domains – surface, deep and achieving and the weighted average of the students’ results was done and the correlation data are as follows:

	Approach to Studying		
	Surface	Deep	Achieving
Spearman's rho	-0.453**	-0.062	-0.141

**** Correlation is significant at the 0.01 level (2-tailed)**

This confirms research findings that surface learners are not likely to do well academically. It is surprising to note that those who are classified as achieving by the Biggs' SPQ do not do well academically.

Some Tentative Conclusions

This study is still incomplete and the researchers venture to make some tentative conclusions based on the data gathered so far.

The correlation of the SPQ with the Students' academic performance shows that students who are surface tend to have lower academic performance. However, the low-achieving students are not necessarily at risk of failing the course. Hence, the SPQ as a diagnostic tool to identify at-risk students in this particular course is questionable. The researchers believed that there are "noise" factors at play that were not taken into consideration in this study. A check with the individual module results shows that students can do very well in some modules but not in other modules. Thus, taking the overall weighted average as an indicator of their academic performance may be inaccurate.

The report that gives feedback to the students on their learning approaches appeared to be useful to those who wants to change (for example, the deep learner) but does not appear to do anything for students who felt that it is difficult to change the way they study. And if their present way of studying does not affect their performance adversely, they will not likely change in spite of the feedback.

As the interview with the tutors was not yet conducted at this point in time, the researchers are not able to form any conclusions about how helpful the class profile report (which contains the students' approaches to learning) has been.

Appendix 1: Student Report

XXXYYYZZZ Polytechnic
 PPPQQRRR Department

Dear : **XXX YYY ZZZ**

This is an analysis of your approach to studying and it depends very much on how accurately you have responded to the questionnaire items. It is important to know that your approach is the result of a response to a situation and therefore is *not cast in stone*. You can, if you want to, change or modify your approach and become a more successful learner – there are strategies suggested below to help you.

What is your approach?

Your *approach to study* profile is as shown. Note that the first row of figures indicate the approach based on your own scores on the questionnaire. The second row of symbols indicate your approach relative to the scores of your cohort.

	Surface	Deep	Achieving
Your scores (maximum = 70)	55	32	42
Comparison with norms for your course*	+	--	o

How to interpret:

Very strong positive preference	++
Strong positive Preference	+
No strong Preference	o
Strong Negative Preference	-
Very strong Negative Preference	--

From the table above, establish whether you are a predominantly surface, deep or achieving learner, or some combinations of the three. Write your approach here: []

If you do not have any dominant patterns, it could mean either (a) you use different approaches for different subject areas, (b) you do not use any particular approach because of disinterest in what you are studying or (c) you may have misinterpreted items in the questionnaire.

What do all these approaches mean?

Read the characteristics below pertaining to your approach or approaches:

Surface Characteristics	Deep Characteristics	Achieving Characteristics
<ul style="list-style-type: none"> Learn without deep understanding see study as a requirement of the family/society that you must meet see the main goal and value of learning as getting a qualification see parts of learning tasks as unrelated to each other do not personally relate to the learning tasks 	<ul style="list-style-type: none"> learn with the intention to understand relate previous knowledge to new knowledge integrate knowledge from different subject areas relate theoretical ideas to everyday experiences distinguish between concepts and examples define own goals and pursue them in one's own way 	<ul style="list-style-type: none"> mainly interested in getting high marks are deliberate and careful in planning their study plan scheduled study times have organised note-taking methods practise exam questions to maximise scores stick closely to the syllabus

What are some of the outcomes of these approaches?

Surface Outcomes	Deep Outcomes	Achieving Outcomes
<ul style="list-style-type: none"> • have limited understanding of theoretical concepts and principles • cannot distinguish between examples from principles • have difficulty in developing a logical argument • cannot recognise key ideas • forgetting things learnt very quickly 	<ul style="list-style-type: none"> • have long term retention of knowledge • able to apply knowledge to new situations • able to generate new meanings and novel ideas • become an independent learner 	<ul style="list-style-type: none"> • generally perform well in test and exams • may become too competitive which can lead to being isolated by other students • may not be able to form deep understanding and interest in a subject

How can you modify your approaches to studying?

Here are some **strategies** for you to try out. The combination that will result in successful academic pursuits is the **Deep+Achieving** approach.

Strategies for <i>Surface</i> learners	Strategies for <i>Deep</i> learners	Strategies for <i>Achieving</i> learners
<ul style="list-style-type: none"> • use study skills to achieve better grades • try to develop an interest in the subject by looking for connections to everyday experiences • discuss what you learn everyday with classmates 	<ul style="list-style-type: none"> • need to check frequently that your own goals are in line with the course objectives • check with the teachers if you think you may be off-track 	<ul style="list-style-type: none"> • very seldom can a person learn on his/her own; collaborating with all kinds of classmates can enhance your learning • develop also a deep approach if you want to pursue higher education

Thank you for doing the Study Process Questionnaire. I wish you enjoyment and success in your study here at Ngee Ann Polytechnic. If you have any queries regarding this report, please see your class tutor.

References:

1. Biggs, John B. 1987. **Student Approaches to LEARNING and STUDYING**. Australian Council for Educational Research (ACER)
2. Biggs, John B. 1992. **Why and How do Hong Kong Students Learn**. Education Paper 14, Faculty of Education, University of Hong Kong