

A Comparison of Learning Strategies, Orientations and Conceptions of Learning of First-year Medical Students in a Traditional and an Innovative Curriculum

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Abstract

Introduction: Students adapt their learning strategies, orientations and conceptions to differences in the learning environment. The new curriculum of the Faculty of Medicine, University of Peradeniya, Sri Lanka, which commenced in 2005, puts greater emphasis on student-centred learning. The aim of this study was to compare the learning strategies, orientations and conceptions measured by means of a validated Sri Lankan version of the Inventory of Learning Styles (ILS) at the end of the first academic year for a traditional curriculum student group and a new curriculum student group. **Materials and Methods:** The Adyayana Rata Prakasha Malawa (ARPM) 130-item Sinhala version of the ILS was administered to students of the traditional curriculum and the new curriculum at the end of their first academic year respectively. Mean scale scores of the 2 groups were compared using independent sample *t*-test. **Results:** Students of the new curriculum reported the use of critical processing, concrete processing and memorising and rehearsing strategies significantly more than those in the traditional curriculum group. With respect to learning orientations, personal interest scores were significantly higher for the new curriculum students while reporting of ambiguity was significantly lower among them. **Conclusion:** The results favour the assumption that changes made to the organisation of subject content and instructional and assessment methods have a positive impact on students' use of learning strategies and motivation.

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Key words: Innovative curriculum, Learning strategies, Orientations, Traditional curriculum

Introduction

During the learning process, learners are found to use specific combinations or patterns of learning activities which are termed learning strategies.^{1,2} It is believed that the quality of learning outcomes achieved by students is dependent to a considerable extent on the learning activities employed by them. These learning strategies can be broadly divided into (a) cognitive processing strategies, e.g. memorising and rehearsing, critical processing and concrete processing and (b) regulating strategies, e.g. a self-regulated strategy, in which the students perform most regulation activities themselves; an externally regulated strategy, in which students let their learning process be regulated by teachers, books, etc., and lack of regulation, when students are unable to regulate their learning processes by themselves, but also experience insufficient support from the external regulation as provided by teachers and the learning environment.²

In the last decade, several researchers have investigated the reported use of these learning strategies employed by students within different learning contexts.³ Many researchers have argued that learning strategies are context-specific and are brought into action in accordance with the specific circumstances of the teaching learning context.³⁻¹¹

Learning orientations encompass all those attitudes and aims, which express the student's individual relationship with a course of study and the university. It has been stated that learning orientation implies that any state or trait is not assumed to belong to the student, but rather represents a quality of the relationship between the student and the course as opposed to a quality inherent in the student and which may therefore change over time.¹²

Learning conceptions are beliefs and views on learning and related phenomena, e.g., conceptions of oneself as a learner, learning objectives and the task division between students, teachers and fellow students in learning processes.

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Vermunt¹³ views learning conceptions as more stable individual variables and learning strategies as more dynamic changeable aspects of learning.

Empirical studies have shown that the quality of knowledge gained by active knowledge construction is better, more accessible, coherent and usable than knowledge acquired by passive means. Thus, in designing instruction, higher education institutes should pay attention to inducing learners to engage in more mentally-demanding learning activities as part of regular instruction, in order to foster an improvement in the quality of learning.

In 2005, the Faculty of Medicine, University of Peradeniya introduced its new curriculum, which is termed the “beyond 2004 curriculum”. A characteristic feature of this new curriculum, in comparison to the traditional curriculum, is the allocation of time as much as 10 hours a week for Student Generated Learning (SGL) in the formal time table and the introduction of learning tasks, which have to be accomplished through group work or independent learning. However, considering the fact that the first year of university education is a transition period in the life of an undergraduate student, a considerable number of lectures are also scheduled. Small group discussions focusing on common clinical scenarios are held, which enable students to identify gaps in their knowledge and learn the relevant basic science concepts. In addition, students are introduced to the clinical thinking process through paper cases, with teachers being expected to function as facilitators.

In this context, we thought it apt to assess the reported learning strategies, conceptions and orientations of medical students following the new curriculum on completion of their first academic year. Since a similar investigation had been carried out in 2001 with a group of students at the end of their first year of the traditional curriculum at the Faculty of Medicine,¹⁴ a comparison of the results of the 2 groups of students was thought to be able to reveal useful information to curriculum developers.

Research Question

Do the medical students report the study strategies at the end of their first year of the MBBS course different in the 2 groups of students whose learning contexts were different?

Materials and Methods

Instrument

The Adyayana Rata Prakasha Malawa (ARPM), the adapted validated Sinhala version of the Inventory of Learning Styles (ILS), was used in this study. The ARPM consists of 130 items and these were grouped into the same scales as the ILS. The inventory scales considered in the present study are described in Appendix 1.

Procedure

The questionnaires were administered at the end of the first academic year of each group of students. In the case of students in the traditional curriculum, the questionnaires were distributed after a lecture and were then collected after their completion.

All the students in the new curriculum group were instructed to collect the questionnaire from a specified place and return the completed questionnaire to the same place. Participation was voluntary. The students were requested to reflect on the past 1 year of their Medical course while responding to the items.

Scores for the learning strategy items were assigned on a Likert scale, ranging from (1) I never or hardly ever did this to (5) I almost always did this, while the scores for the conceptions of learning and learning orientation items were assigned on a scale ranging from (1) completely disagree to (5) completely agree.

Participants

Participants were 144 out of 175 medical students of the traditional curriculum on completion of their first academic year and 144 out of 184 medical students of the new (innovative) curriculum on completion of their first academic year.

Data Analysis

Means and standard deviations of each scale were calculated at group level for both groups of students respectively. Independent sample *t*-tests were performed to identify the presence of significant differences in the scale scores at group level.

Results

The response rate was 82% for the traditional curriculum group and 79% for the innovative curriculum group. The internal consistencies (Cronbach alpha) of the different scales varied from 0.69 to 0.98. These internal consistencies were comparable to those reported in the Dutch studies.¹³

As shown in Table 1, the students of the new (innovative) curriculum reported significantly higher scores for 2 deep processing strategies, critical processing and concrete processing compared to the traditional curriculum group of students. The same group also reported higher scores for memorising and rehearsing, which is more of a surface strategy.

With respect to regulation strategies, students of the new curriculum reported higher scores for both self-regulation and external regulation. Among the study orientations, new curriculum students scored high on personal interest and low on the ambivalent scale. There were no differences in the scoring pattern of learning conception scales.

Table 1. Results of the Independent Sample *t*-tests for Learning Strategies, Conceptions of Learning and Learning Orientation Scores of the 2 Groups of Medical Students

| ARPM scales | 1999/2000 batch at the end of the first year of a traditional curriculum Mean (SD) n = 144 | 2004/2005 batch at the end of the first year of an innovative curriculum Mean (SD) n = 144 | T value |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------|
| Learning strategies: processing and regulation strategies | | | |
| Relating and structuring | 3.17 (0.77) | 3.30 (0.61) | 1.59 |
| Critical processing | 2.32 (0.87) | 2.55 (0.77) | 2.38* |
| Memorising and rehearsing | 2.41 (0.73) | 2.90 (0.71) | 5.77** |
| Analysing | 3.02 (0.68) | 3.16 (0.67) | 1.76 |
| Concrete processing | 3.19 (0.87) | 3.45 (0.74) | 2.73* |
| Self-regulation | 2.75 (0.67) | 2.92 (0.73) | 2.06* |
| External regulation | 3.11 (0.60) | 3.28 (0.63) | 2.34* |
| Lack of regulation | 2.84 (0.79) | 2.86 (0.86) | 0.21 |
| Conceptions of learning | | | |
| Construction of knowledge | 3.93 (0.5) | 3.91 (0.42) | 0.37 |
| Intake of knowledge | 3.74 (0.45) | 3.73 (0.43) | 0.79 |
| Use of knowledge | 4.16 (0.47) | 4.12 (0.40) | 0.78 |
| Stimulating education | 3.80 (0.77) | 3.86 (0.56) | 0.76 |
| Cooperative learning | 3.85 (0.91) | 3.80 (0.62) | 0.54 |
| Learning orientations | | | |
| Personally interested | 3.44 (0.63) | 3.63 (0.62) | 2.58* |
| Certificate directed | 3.39 (1.18) | 3.26 (0.65) | 1.16 |
| Self-test directed | 3.41 (0.72) | 3.57 (0.67) | 1.95 |
| Vocation directed | 4.10 (0.79) | 4.19 (0.61) | 1.08 |
| Ambivalent | 2.84 (0.77) | 2.65 (0.73) | 2.15* |

ARPM: Adyayana Rata Prakasha Malawa

Note: **P* <0.05, ***P* <0.01, ****P* <0.001

Discussion and Conclusion

The students of the new curriculum reported greater use of concrete processing and critical processing strategies during the first year of the course. The same group of students also scored higher for personal interest and lower for ambivalent orientation. These findings are encouraging and a favourable development. However, it was disturbing to find that the students of the new curriculum reported a higher use of memorising and rehearsing in comparison to the traditional curriculum students. It should be borne in mind, however, that Asian learners do rehearse a lot in order to understand the subject content and memorise the facts as an adaptive strategy to obtain high grades at examinations.¹⁵

Especially at the first year level, some students are not proficient in the medium of instruction, which is English. Hence, they may rely on the memorisation and rehearsal strategy to grasp new concepts taught in their first year. In the “beyond 2004” new curriculum, all the systems of the body are being introduced at a basic level, meaning that there are many new terms to be learnt for the first time. This situation may lead to greater engagement in rehearsal and memorisation. A contributory factor for the latter

observation could also be that the examination system has not changed parallel to the changes in instructional strategies, with the curriculum still evolving to its envisaged level.

Furthermore, medical students of the new curriculum reported the use of self-regulation and external regulation strategies considerably more than the traditional curriculum students. This finding support the observation of several researchers that learning strategies that do not work together among Western students could very well work together among Asian students.^{16,17} On the whole, the students of the new (innovative) curriculum, reporting greater use of external regulation and memorising and rehearsing strategies along with other deep learning strategies, signal the possibility of a mismatch between instructional design and assessment strategies.

A limitation of the present study is that it was carried out with only one batch of new curriculum students. Thus, it would be more informative to continue the study with successive batches of students.

However, the results of the current study support the argument that learning strategies and motivation are subject to change and that a curriculum that puts greater emphasis on the learning process encourages meaningful learning.

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Appendix 1. Description of the Scales of the Inventory of Learning styles (ILS), Including a Sample Item for Each Scale (Based on Vermunt, 2005)

| Parts and scales of the ILS | Description of content |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processing strategies | |
| Deep processing Relating and structuring | Relating elements of the subject matter dealt separately in the course to each other and to prior knowledge, structuring these elements into a whole. 'I try to relate new subject matter to knowledge I already have about the topic concerned'. |
| Critical processing | Forming one's own view on the subjects that are dealt with, drawing one's own conclusions, and being critical of the conclusions drawn by textbook authors and teachers. 'I draw my own conclusions on the basis of the data that are presented in a course'. |
| Stepwise processing Memorising and rehearsing | Learning facts, definitions, lists of characteristics by heart by rehearsing them. 'I make a list of the most important facts and learn them by heart.' |
| Analysing | Studying the subject matter in a stepwise fashion, studying the separate elements thoroughly, in detail and one by one. 'I do not proceed to a subsequent chapter until I have mastered the current chapter in detail'. |
| Concrete processing | Applying the learnt subject matter by connecting the new knowledge to one's own experiences and by using in practice what one learns in a course leading to knowledge integration. 'I use what I learn from a course in my activities outside my studies'. |
| Regulation strategies | |
| Self-regulation Learning process and outcomes | Regulating one's own learning processes through regulation activities like planning learning activities, monitoring progress, diagnosing problems, testing one's outcomes, adjusting and reflecting. 'To test my learning progress when I have studied a textbook, I try to formulate the main points in my own words'. |
| Learning contents | Taking the initiative to consult literature and sources outside the syllabus. 'In addition to the syllabus, I study other literature related to the content of the course.' |
| External regulation Learning process | Letting one's own learning processes be regulated by external sources, such as introductions, learning objectives, directions, questions or assignments of teachers or textbooks authors. 'I learn everything exactly as I find it in the textbook'. |
| Learning outcomes | Testing one's learning results by external means, such as the tests and questions provided by teachers and text books. 'If I am able to complete all the assignments given in the study materials or by the teacher, I decide that I have a good command of the subject matter.' |
| Lack of regulation | Having problems with the regulation of one's own learning processes 'I notice that I have trouble processing a large amount of subject matter'. |
| Conceptions of learning | |
| Construction of knowledge | Learning viewed as constructing one's own knowledge and understanding. Most learning activities are seen as tasks of students. 'I should look for relationships within the subject matter of my own accord'. |
| Intake of knowledge | Learning viewed as taking in knowledge provided by education through memorising and reproducing; other learning activities are tasks of teachers. 'I should repeat the subject matter on my own until I know it sufficiently'. |
| Use of knowledge | Learning viewed as acquiring knowledge that can be used by means of application in day-to-day activities. These activities are seen as tasks of both students and teachers. 'To me, learning means acquiring knowledge that I can use in everyday life.' |
| Stimulating education | Learning activities are viewed as tasks of students, but expect teachers and textbook authors to continuously stimulate students to use these activities. 'The teacher should motivate and encourage me'. |
| Cooperative learning | Attach value to learning in co-operation with fellow students and sharing the tasks of learning with them. 'I consider it important to discuss the subject matter with other students.' |
| Learning orientations | |
| Personally interested | Studying out of interest in the course and to develop oneself as a person. 'I do these studies because I like to learn and to study'. |
| Certificate oriented | Striving for high study achievement; main purpose of studying is to pass examinations and to obtain certificates, credit points and a degree. 'The main goal I pursue in my studies is to pass exams'. |
| Self-test oriented | Studying to test one's own capabilities and to prove to one self and others that one is able to cope with the demands of higher education. 'I want to prove to myself that I am capable of doing studies in higher education'. |
| Vocation oriented | Studying to acquire professional skill and thereby obtain a(nother) job. 'For the kind of work I would like to do, I need to have studied in higher education'. |
| Ambivalent | An uncertain attitude toward the studies, one's own capabilities, the chosen subject area, the type of education, etc. 'I doubt whether this is the right subject area for me'. |