Research Article

Learning Strategies of Anatomy in First and Second Years of Medical Studies

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Abstract

Introduction: For many years, one of the current trends has been to give to medical students the tools they need to benefit from the best possible strategic skills for the learning of medicine. Anatomy is one of the essential disciplines for the implementation of this change. This process must involve identifying the learning styles used by the students. The purpose of this work was to describe the learning styles developed by the students of the Saint-Louis Faculty of Medicine during the anatomy course.

Materials and methods: A descriptive and cross-sectional study was conducted among the first and second year medical students. An anonymous questionnaire was used to gather the opinion of the students.

Results: All students answered the questionnaire. The sample of 133 students was made of 98 men and 35 women. The learning styles of our students were varied, but they had a preference for intuitive methods.

Conclusion: It is important to adapt the teaching of anatomy to the learning styles of our medical students. An effort must also be made to help students diversify their learning strategies.

Introduction

Promoting the learning autonomy of our students is a major concern of modern educators, in medicine as in other disciplines. This fundamental objective motivated more or less revolutionary pedagogical changes in our medical schools. However, despite the means implemented, the learning strategies of our learners are not always suitable in relation to the requirements of our programs [1], especially in anatomy, thus generating anxiety and frustration, both for students and educators.

In medical disciplines such as anatomy, students must transfer their knowledge from basic sciences to clinical sciences, and then from clinical sciences to practice. In order to do this, it is not enough to apply a general problem-solving strategy, but one must have abundant, highly organized and specific knowledge [2-4].

The authors of this work report the learning strategies of first and second year medical students in the anatomy lesson, to better help them to attain this discipline.

Subjects, Materials and Methods

Type of Study

This is a descriptive study, of a cross-sectional nature, conducted at the end of the annual anatomy course with students of the Saint-Louis' Faculty of Medicine.

Sampling

We solicited the participation of the students of two successive level of study of the Faculty of Medicine of Saint-Louis, respectively enrolled in first and second year. The total population of the study thus consisted of all the students of these various promotions, enrolled during the academic year, for a total of 133 students. The identification of individuals to be in the different groups was made using the lists provided by the pedagogical department of the Faculty. Solicitations to participate in the survey were made by direct contact in teaching rooms. During these contacts, the investigator explained the interest of the study and clarified the content of the different items to the participants.

Material and Methods

Because it applied well to the professional skills targeted by medical studies, we used as a classification of learning strategies, that of Boulet et al [5]. The different learning strategies on which the students were questioned concerned cognitive strategies (repetition, elaboration, organization, compilation, generalization and discrimination), metacognitive strategies (planning, control and regulation), affective strategies and management strategies. They had 60 minutes time. Students were interviewed using an anonymous questionnaire containing closed questions. So that our students

easily answer the questionnaire, for each item, simple questions were orally proposed to them. For example: is it necessary to systematically rearrange the pedagogical content of your lessons before memorizing them? (Organization – Cognitive strategies); do you use specific techniques to maintain your motivation? (Maintain his motivation - Affective strategies). Students also had the opportunity to add free comments to their sheets. The sheets were collected during the same contact.

Results

All students answered the questionnaire and the abstention rate was 0. Students were 18 to 23 years old (average age 20.5). The sample consisted of 98 male and 35 female students.

The results were distributed as follows:

Cognitive strategies

Learning declarative knowledge

Repetition: reformulation of information in the same terms

[yes] **58**   [no] **75**

Elaboration: reformulation of information in different terms, adding personal information to those presented

[yes] **64**   [no] **69**

Organization: prioritization, categorization and transformation of information

[yes] **75**   [no] **58**

Learning procedural knowledge

Compilation: decomposition of knowledge relating to a complex activity into simpler sequences (proceduralisation) then induction of a more global representation (composition).

[yes] **25**   [no] **108**

Learning conditional knowledge

Generalization: reconstruction of knowledge so that it applies to several cases.

[yes] **24**   [no] **109**

Discrimination: restriction of the repertoire of situations to which knowledge applies.

[yes] **28**   [no] **105**

Metacognitive strategies

Planning: scheduling of learning activities

[yes] **17**   [no] **116**

Control: judgment on ongoing learning activities

[yes] **65**   [no] **68**

Regulation: (Re) adjustment of its activities in relation to its goals

[yes] **79**   [no] **54**

Affective strategies

To maintain his motivation

[yes] **84**   [no] **49**

To maintain his concentration

[yes] **100**   [no] **33**

To control his anxiety

[yes] **94**   [no] **39**

Management strategies

To manage his time effectively

[yes] **34**   [no] **99**

To manage the material resources (including the study environment)

[yes] **96**   [no] **37**

To manage the support of people (study groups)

[yes] **104**   [no] **29**

In the free comments of the students it appears that this study allows having a more scientific approach of learning strategies. It improves the learning techniques of anatomy. This is an important advantage given the volume of teaching and the time allotted. When students use the simple memorization of anatomy lessons, limits learning abilities. While improved learning strategies can allow managing educational information. However, students also formulated limitations when exploiting these various learning strategies. For some of them it is difficult to study the anatomy even using the strategies of which the study speaks. Moreover, these strategies are interesting, but it is unfortunate to mention them only in the context of a pedagogical study. The students propose the teaching of these strategies to be included in the classical program of anatomy. The density of anatomy lessons forces students to study all the time and in a repetitive way. The increase in the volume of practical will improve the learning of anatomy whatever the strategy used.

Discussion

This work was motivated by the general process of institutional pedagogical reform initiated at the Gaston Berger University of Saint-Louis and its faculty of medicine, with the intention of improving the quality of student learning and afterwards to bring contribution to improving the skills of future graduates by identifying and taking into account of their learning styles. When we asked students if they wanted to participate in the survey, the number of enthusiastic students surprised us. The possibility of remaining anonymous probably contributed to the sincerity of the answers given by the students. The questionnaire was given to student volunteers at the beginning of the second semester, after the January exam session closing the teaching of anatomy at all academic levels. An explanation of the meaning of the questionnaire was given, commenting on its interest and the sincerity required completing it. This questionnaire is written in French, which facilitated its administration. It is composed of 15 situations, for which two possible answers are proposed: "yes" and "no". Students are invited to choose their answer after a few minutes of reflection.

Although students admitted to medicine have an excellent academic record, we observed that a significant number of them reported psychological distress to the requirement of success in their medical studies. Individual interviews highlighted deficient strategies, bad time management, increased anxiety and demotivation.

Research suggests the importance of curricula teaching learning strategies. The main benefits of such a program appears to be mainly the students' confidence in their learning competence and motivation to study [6-8]. However, we should change our way of assessing students, for them to understand the philosophy of the program. Gruppen et al [9], of the Michigan Medical School, studied 107 of their third year trainees at the time of the three-month internship. The authors conclude that their medical students were new to metacognitive strategies. Therefore, it seems that at the post-secondary level in general - and even at the university level in medicine - not all students are able to spontaneously acquire strategies to promote effective learning. A global educational context that solicits and promotes the use of effective strategies is therefore an attractive choice [6]. Under such a system, having a curriculum that teaches such strategies is a hypothesis that may prove useful. Knowledge of the tools used can lead students to better understand their behavior in the study, to adapt to different teaching situations. A better knowledge of his metacognitive strategies could help the student in the management of his stress [6,10]. Knowledge of certain gaps in the learning may also help the teacher to improve his teaching.

A review of the literature allows us to identify seven conditions for the success of these programs: (1) to convince students of the relevance, for themselves, that they develop their learning strategies [11]; (2) show how to apply these strategies, offering repeated opportunities for feedback-driven practice [11]; (3) teach not a single tactic, but rather a repertoire of strategies in which the student can draw not only cognitive strategies but also metacognitive [12], affective [13] and management strategies [5]; (4) to develop also the knowledge of the conditions in which this or that strategy applies more specifically [5,11,14]; (5) teach learning strategies in the student's own disciplinary context [12]; (6) ensure that such a program is fully supported by the faculty [13]; and (7) verify the conformity of the evaluation system with the philosophy of the program [13].

The methodological limitations of our work are those of the original study, namely that the questions concerning all the tools are closed-ended and that the sample of students is small. Other limitations of our study must also be mentioned. Indeed, the objective of the survey was not well understood by some students and some terms were not well understood, despite the administration of the questionnaire by an investigator to clarify the purpose as well as some items. However, the most important discussion about our work is of a different nature. Finally, it concerns the importance of addressing students' learning styles.

In summary, a supportive learning environment is necessary to encourage the acquisition of independently developed knowledge, but it is insufficient on its own in the absence of adequate teacher guidance. The faculty must determine the modalities for the application of this support explicitly. Teachers are partly responsible for the lack of autonomy of our students, mainly because they consider that the acquisition of this quality is implicit and that, for this reason, they pay no attention resulting in the establishment of structured support.

Conclusion

All in all, the results of our study show that Saint-Louis medical school students mostly use an intuitive learning style; they use intuition to capture concepts and tend to apply them to new experiences to solve problems. The need to systematically take into account the learning styles of students within the framework of specific pedagogical devices is currently the subject of critical discussions.

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