Students’ perceived value of physiology course activities in a Sudanese medical faculty

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Kaddam L, Elnimeiri MK. Students’ perceived value of physiology course activities in a Sudanese medical faculty. Adv Physiol Educ 36: 298–301, 2012; doi:10.1152/advan.00070.2012.—The physiology course in our department consists of lectures, laboratory sessions, and tutorials, all of which are teacher centered, as well as student-led seminars. The overall aim of this project was to investigate student perceptions of the value of varying academic activities on their learning of physiology. A faculty-based descriptive study was conducted at the Faculty of Medicine and Health Sciences of Alneelain University (Khartoum, Sudan). Questionnaires (150 total) were distributed to students from the Schools of Medicine, Dentistry, and Physiotherapy; 127 questionnaires were completed and returned. The results showed that 108 students (85%) believed that their absence from different academic activities could affect their performance. Students perceived lectures as the most valuable academic activity (90.7%), whereas seminars presented by students were perceived as the least important activity (18.5%). There was a significant correlation between lectures attendance and their performance in examinations (P = 0.008). Ninety percent of the students thought that teacher involvement in tutorials was essential and that lectures were useful to understand certain topics. These results showed that in our course, students perceived teacher involvement as a key component of the educational process.

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AT ALNEELAIN UNIVERSITY, the MBBS curriculum and the physiology course are traditional and mostly teacher centered. The faculty awards the MBBS degree to students after the successful completion of 11 semesters. The first five semesters are the preclinical phase, where basic sciences (including physiology) are taught, and the other six semesters are the clinical phase. Physiology instructional activities include the following: lectures (4 h/wk), laboratory practical sessions (3 h/wk), tutorial sessions (2 h/wk), and seminars presented by students after they finish each system under the teacher’s supervision. Most of these activities are guided and managed by teachers. Also, because of a lack of laboratory equipment, some practicals are descriptive rather than interactive, as the experiments are just explained to students.

A style of teaching that is dependent on didactic lectures and other academic activities managed by teachers does not develop the self-directed learning skills that are required of a healthcare professional (4, 10, 12, 13, 16). Realizing this, Alneelain University recommended the implementation of the SPICES instructional model (where S is student centered, P is problem based, I is integrated, C is community based, E is electives, and S is systematic) (11).

Physiology has undergone many innovative changes regarding the teaching and learning environment (3, 7, 15, 19). Novel teaching methods that mainly depend on interactions rather than simple recall have proven to be more effective in learning physiology than traditional methods (9).

Despite university recommendations and the success of novel teaching methods, our school still teaches in the traditional way, where didactic lectures are the cornerstone of the teaching process. Some of the resistance to change may be part of our cultural expectations of both faculty members and students. In the traditional curriculum, faculty members feel that the role of the teacher is powerful since the “impact of our teaching will extend long beyond our life time because a small part of every teacher is in the students we taught” (6). Students also seem to value the educational role of faculty members in our institution, although this has not been well documented. The overall aim of this article was to investigate student perceptions about the effect of varying academic activities on their learning of physiology. This information can guide the planning necessary for introducing a more learner-centered model of instruction.

MATERIALS AND METHODS

A faculty-based descriptive study was conducted at the Faculty of Medicine and Health Sciences of Alneelain University (Khartoum, Sudan). This school is a governmental college funded mainly by the Sudanese Ministry of Higher Education. The school follows a traditional MBBS curriculum, and physiology is taught in semesters II–IV. Students of medicine, dentistry, and physiotherapy take the physiology course together since they study together for the first 2 yr.

A standardized (questions were of the same sequence, same wording, and same order) self-administered questionnaire was developed and pretested by five upper-class students. Those students were from the Faculty of Medicine and Health Sciences, and their responses were not included in the study. The questionnaire was then revised, corrected, and finalized. Questionnaires (150 total) were distributed to students from different schools after the end of the physiology class (total coverage of the students was targeted), and 127 questionnaires were completed and returned by the students. The response rate was ~85%. The questionnaire consisted of 50 close-ended questions focused on student perceptions of the teaching methods used in physiology, the importance of lectures to the students, students’ ability to study on their own, their results in the last physiology exam they had before the survey, and their opinions of whether physiology is relevant to their future career. The questionnaire language was Arabic, which was translated into English for this report.

Ethical approval was obtained from the Institutional Review Board of the Faculty of Medicine and Health Sciences of Alneelain University. The questionnaire was anonymous, and verbal consent was obtained from each student after a thorough explanation of the study’s
Table 1. Student distribution by sex and school

<table>
<thead>
<tr>
<th>School of Medicine</th>
<th>Male Students</th>
<th>Female Students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td>27</td>
<td>58</td>
<td>85</td>
</tr>
<tr>
<td>Percentage of class</td>
<td>31.8</td>
<td>68.2</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School of Dentistry</th>
<th>Male Students</th>
<th>Female Students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td>4</td>
<td>22</td>
<td>26</td>
</tr>
<tr>
<td>Percentage of class</td>
<td>18.2</td>
<td>81.8</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School of Physiotherapy</th>
<th>Male Students</th>
<th>Female Students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td>1</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Percentage of class</td>
<td>4</td>
<td>96</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Student perceptions of the effect of absence from academic activity on their performance

<table>
<thead>
<tr>
<th>Activity</th>
<th>Absence Affects Exam Performance</th>
<th>Absence Does Not Affect Exam Performance</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Students</td>
<td>Percent</td>
<td>Number of students</td>
</tr>
<tr>
<td>Lectures</td>
<td>98</td>
<td>90.7</td>
<td>10</td>
</tr>
<tr>
<td>Practicals</td>
<td>84</td>
<td>77.8</td>
<td>24</td>
</tr>
<tr>
<td>Tutorials</td>
<td>73</td>
<td>67.6</td>
<td>35</td>
</tr>
<tr>
<td>Seminars</td>
<td>20</td>
<td>18.5</td>
<td>88</td>
</tr>
</tbody>
</table>

RESULTS

One hundred twenty-seven students responded, with most of them being female students and medical students (Table 1). Respondents were between 17 and 23 yr of age (mean: 18.9 yr).

Table 2 shows that 108 students (85%) believed that their absence from different academic activities could affect their performance, whereas 15% of them denied this. We asked the students who answered “yes” (108 students) which activity affected their learning most, and those students perceived lectures as the most valuable academic activity (90.7%), whereas the seminars that were presented by students were perceived as the least important activity (18.5%).

This perception was validated when we asked the students about their results in the end-semester II examinations and the status of their attendance, which is compulsory according to the regulations of the faculty; there was significant correlation between lectures attendance and student performance in the end-semester examinations ($P = 0.008$; Table 3).

As shown in Table 4, 90% of the students reported that teacher involvement in the tutorial is essential and that lectures are useful to understand certain topics. More than half of the students stated that it is difficult to study the subject on their own. Most of the students also indicated that the case study of real patients is useful to understand physiology.

The majority of students (94.5%) used less than three references in studying physiology, with a tendency to rely on certain references rather than using more references to search for knowledge (Table 5). Most students (85.6%) stated that references are available in the library (data not shown).

About 94% of the students strongly agreed or agreed that studying physiology is relevant for studying other subjects and that it is relevant to their future professional career (Table 6).

DISCUSSION

Teaching physiology in our traditional curriculum is mainly teacher centered, as it depends on lectures as the main source of information for students. Tutorials, practical sessions, and seminars are complementary course activities that do not greatly influence students’ performance. Such results are expected as the students had more contact hours for lectures and fewer for practical, tutorials, and seminars. Physiology principles everywhere are the same, but the approach to teaching varies among different colleges and schools. Often, how we teach is more important than what we teach (4, 6, 18). The data from this survey indicate that our students value the teacher-based system adopted for teaching of the subject. They perceived lectures as the most important way to understand physiology. This finding runs in contrast to a decrease in global interest in didactic lectures (13), even in low-resource settings (4, 10). Most studies have revealed that students showed more interest in peer-review tutorials (3, 4, 10). In our case, 90% of our students reported teacher participation in tutorials is essential, and actually what happens in this case is that the tutorials are transformed into mini-lectures. Most of our students studied from a limited number of references, signifying the students’ tendency to focus on lectures rather than searching for knowledge in the references. Half of the students stated that it is difficult to study the subject on their own, giving more evidence that our students are passive learners.

One of the objectives of undergraduate teaching is to graduate students who have the necessary skills for self-directed learning (18). However, it is worth mentioning that most of our students came from a preuniversity general education system that is unsupportive for self-directed learning, and, consequently, they enter the university as passive rather than active learners. It is our responsibility as teachers to motivate students to be self-directed and active learners. Despite the satisfaction of the students with the current teaching methods, it is necessary to incorporate innovative teaching methods to enhance the overall performance of our educational system.

There has been sustained increase in physiology knowledge in the last century, but our university still teaches in a very traditional way (17). Instructors can’t cover all the content (6), and any attempt to do this will limit our student’s ability to...
learn on their own (20). Students at our school can also contribute to the resistance to change through their stated preference for familiar teaching settings. Our study indicates the importance of preparing students as well as instructors for their role in the learning process.

In conclusion, it is difficult for us to change the way we teach (17, 18), but necessary that we do so for the benefit of our students. Interactive teaching methods can and should be introduced to compliment the didactic lectures. Problem-based learning (2, 5, 8, 14), self-directed study (1), and peer-review discussion (3, 14) are examples of student-centered activities that can help students to be motivated to become lifelong learners after graduation. The curricula and courses should be designed to encourage students to take responsibility for their own education.

DISCLOSURES

No conflicts of interest, financial or otherwise, are declared by the author(s).

AUTHOR CONTRIBUTIONS

Author contributions: L.K. and M.K.M.E. conception and design of research; L.K. performed experiments; L.K. and M.K.M.E. interpreted results of experiments; L.K. drafted manuscript; L.K. and M.K.M.E. edited and revised manuscript; L.K. and M.K.M.E. approved final version of manuscript.

REFERENCES

### Table 6. Student perceptions about the importance of physiology for their future study and career

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studying physiology is relevant for studying other subjects</td>
<td>95 74.8</td>
<td>20 15.7</td>
<td>7 5.5</td>
<td>3 2.4</td>
<td>2 1.6</td>
</tr>
<tr>
<td>Studying physiology is relevant for my future professional career</td>
<td>104 81.9</td>
<td>13 10.2</td>
<td>5 3.9</td>
<td>3 2.4</td>
<td>2 1.6</td>
</tr>
</tbody>
</table>