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Studying public health. Results from a questionnaire to estimate medical students’ workload

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Abstract

The European Credit Transfer and Accumulation System (ECTS) is an important tool used in many medical schools. There is a recognised need to balance workload and credit allocation. In 2007, a new Public Health study unit was introduced in the fifth year of a Portuguese Masters in Medicine. At the end of the final exam, a specifically developed self-completed questionnaire was given to all students. It covered three areas: learning objectives, teaching methods and workload. This paper focuses on workload. Only 190 questionnaires were valid. The number of hours needed to complete this study with success unit had enormous variability. Based on the workload criterion alone, most students should have received an extra 2.5 ECTS over and above those given. Despite methodological limitations, the results seem to show that the allocation of ECTS complied with values recommended by the European Union.

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1. Introduction

The Bologna declaration of 1999 triggered a movement of changes in teaching methods that were agreed and developed at successive conferences by European Ministers, responsible for universities (EC, 2011; Patrício et al., 2010; Martínez et al., 2006). These changes aimed to make national systems converge (EC, 2011).

The European Credit Transfer and Accumulation System (ECTS) is a central tool in that process (EC, 2011). The European Union Commission recommended that each learning outcome be expressed in terms of credits, with a student workload ranging from 1,500 to 1,800 hours for an academic year, and one credit (1 ECTS) corresponding to 25-30 hours of work (EC, 2011), which includes “contact hours” with teachers, in lectures, tutorials and other types of activity such as exams and individual study.

The model that resulted from the Bologna declaration, as applied to medical education, has been the subject of debate (Lobato et al., 2010) and controversy (Cumming A et al., 2010). Although the arguments will not be detailed here, several authors have recognized the positive potential of the “Bologna reforms” to medical education (Patricio et al., 2010; Lobato et al., 2010; Cumming et al., 2010).

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The Instituto de Ciências Biomédicas Abel Salazar (ICBAS), part of the University of Porto (Portugal), is actively involved in the Bologna Process. The old medical course was reformed and became a Masters in Medicine (MIM - Mestrado Integrado em Medicina) in 2007. In the same year a new Public Health (PH) course unit (2.5 ECTS credits) was introduced in the 5th year of the MIM (ICBAS, 2011). The author was given the task of setting up and teaching on this course unit, which had to be taught over a 15 week period (2 hours per week; a total of 30 hours of “contact”). Learning objectives, contents and teaching methods were to be “competency-based” (Martínez et al., 2006; Edwards et al., 1999; Armenian et al., 2001) and ECTS credits had to reflect the amount of work needed to “gain” those competencies (EC, 2011; Martínez et al., 2006).

It has been recognized that it is important to compare education results between different medical schools (Muijtjens et al., 2008) and to monitor local approaches (Breipohl et al., 2000), in Europe. As mentioned before, the European Union Commission made recommendations on the allocation of ECTS credits and their equivalence with workload (EC, 2011). However, studies that have actually estimated the workload needed to reach a study unit’s learning objectives are scarce, although those that exist have used written questionnaires completed by students. (Martínez et al., 2006).

Thus, a written questionnaire for self-completion by students was developed covering the following areas: self-assessment of their achievements in terms the learning objectives; opinions on the teaching methods and formats and estimates of their workload in hours. It was given to students to complete in the academic years of 2008/2009 and 2009/2010. Only the results concerning workload estimates are presented in this study.

2. Methods

2.1. Formal evaluation of students

The final written exam accounted for 60% of the final mark while participation in group work (study presentations, group discussions and quizzes) accounted for 40%. In the end of the exam, The questionnaire, which was voluntary and anonymous, was given to all students at the end of the written exam to be answered immediately.

2.2. The questionnaire

The questionnaire covered three areas: learning objectives, teaching methods and formats, and workload and was developed from a pilot study conducted in the academic year 2007/2008.

To estimate workload, students were asked to write down the time they had spent in each of four activities: preparation of the presentation and discussion a topic that was assigned to their group, studying the subjects allocated to other groups, preparing and correcting the test (“quiz”) and specifically studying for the final exam. For each of these four activities students were asked to distinguish individual from group study/work. Those estimates do not include the “contact hours” spent in classes or tutorials with the teacher, or in the final exam.

2.3. Data analysis

Questionnaires were answered in the academic years of 2008/2009 and 2009/2010. Time spent in different learning activities was treated as a numeric continuous variable; minutes were converted to decimal parts of the hour. Three numeric variables (individual, group and total hours of study) were created for each of the four types of activity/study. The sum of all hours, in all types of activities was another derived variable. In order to measure total workload another variable was created as the sum of the variable mentioned before, with the number estimated as the average number of contact hours by student (with teaching staff). A log transformation of this variable was needed for some of the analysis.

3. Results

3.1. Formal student achievements
Of the 282 students registered in Public Health in the academic years of 2008/2009 and 2009/2010, 268 successfully completed the study unit. The reasons for failure were: not attending the minimum number of classes required or failing to attend the final written exam. Thus, no student was excluded if they submitted to the formal evaluation procedures. Questionnaires were returned by 219 (81.7%) of the 268 students attending the final exam. Results from questions on learning objectives and teaching methods/formats have been published elsewhere: improvements were reported by the students for all learning objectives (Gonçalves, 2011).

3.2. Student workload

Out of the 219 questionnaires returned, 29 had missing or inconsistent values on time of study/work reported by the students. Thus, only 190 questionnaires were used for the purposes of workload estimates (Tables 1 and 2).

The summary statistics of time spent in each of four academic activities, individually and in groups, are shown in Table 1. All distributions were highly asymmetrical, as can be seen from the big differences between the values for the mean and the median in each variable. If histograms were presented for all variables, the general pattern would be the classical distribution “skewed to the right”, with very extreme high values.

As an example of the extreme high values, one student reported having spent 80 hours of individual study/work and 48 hours on group work “preparing the topic to be presented in a group session” – a total of 128 hours! Another student reported a total of 168 hours studying the topics the other groups presented, before the exam. Two other students reported having spent 160 hours of individual study “preparing the “quiz” presented by their group” and 100 hours of group study/work for the very same activity, which added up to 260 hours! In general, students reporting high values did so consistently throughout all activities.

At the other extreme, several students reported “zero hours” of study/work for some specific tasks (Table 1).

Even with such asymmetrical variations some general patterns are clear. On average, more time was spent preparing for the final written exam then for any other activity. More time was spent on individual work, even in activities such as “preparing the topic to be presented in a group session”.

Based on the available records each student attended, on average, 26.29 hours of classes of any type, which was probably an overestimate of the true value. Taking into account the 100 minutes of the final exam, which many students completed in less time, the value of 28 hours per student was calculated to be the average “contact time” with the teaching staff. This value (28.00) was added to the total number of hours reported as study/work time in the questionnaire (over and above “contact time”), making a new variable measuring the “total workload” required to complete the study unit. The median time was 76.75 hours (Table 1) which corresponded to 30.7 hours of work for each ECTS credit. Since the EC (EC, 2011) recommends that 25 to 30 hours corresponds to 1 ECTS, these two values (25 and 30 hours) were used as minimum thresholds (see Table 2), to estimate the number of credits allocated to the students of PH, if ECTS credit units were just credited by (reported) total workload in hours. If the more “demanding” criterion of 30 hours per credit unit was used, 47.9% of the students would have been given less then the official 2.5 credits, dropping to 30.5% for the more “easy” 25 hours threshold (Table 2). In both cases, many students worked many more hours than those required to get the 2.5 credits; some workloads corresponded to 5+ ECTS credits!

4. Discussion

4.1. Internal validity

How precisely did students report the number of hours of study/work they did? This is a key question relating to internal validity of the study.

Written questionnaires to estimate study hours have been recognised as lacking precision, leading to the development of interesting alternative instruments like computer desktop applications (Ercan et al., 2009), but actual estimations using this instrument have not been published. The numbers of study hours reported by some of the students seem exaggerated or even impossible. I think that it is reasonable to suppose that, for most students, recall bias has conspired with the emotional wish to convince the teacher that a desirable “ideal” workload had been used and not the real time spent studying. For those reporting zero hours on some activities, confidentiality was certainly
vital. What is the message they were trying to convey to the teacher? Although data on workload may not be precise, the variation between students in hours studying and by types of activities are very likely to be valid.

4.2. External validity

I am not sure if these results can be extrapolated to all Portuguese medical students let alone European ones. More studies are needed to compare results (Muijtjens et al., 2008) and assess local experiences (Breipohl et al., 2000) between different medical schools.

4.3. Main findings and their comparison with the literature

The estimate of workload, measured in total number of hours is difficult to compare with results from studies in areas other than public health (Martínez et al., 2006). The results seem to show a very wide variability between students. While that variability could be partly due to differences in individual capacities and study strategies, the results seem to point to an unequal individual commitment and workload within groups. Group-work may have important advantages but also creates clear injustices when students are marked; it is difficult to overcome the problem of the students not doing their fair share of the work. I would say, however, that the issue is an interesting “reflection” of what may happen in public health practice and is thus a good learning experience.

The mentioned wide variation of the workload would be translated into a wide allocation of credit units, should the number of hours be the criterion. But the PH study unit had been “given” a priori 2.5 credit units. Moreover, all students succeeded in the study unit and seem to have reached the proposed objectives (Gonçalves, 2011). Are there such different levels of time-efficiency between students? It is a pity that we could not link those opinions with the actual marks in the different components of students’ assessment, but questionnaire confidentiality imposes that limitation. Though this recommendation might be a common one, it is obvious that more studies are needed to estimate workloads and their correlation with ECTS credit allocation.

Table 1. Workload expressed in hours, by type of activity/study, both individually and in group (190 valid questionnaires)

<table>
<thead>
<tr>
<th>Type of activity/study performed by the students</th>
<th>Summary parameters</th>
<th>Individual study in (hours)</th>
<th>Study in group in (hours)</th>
<th>Individual + in group (in hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Preparing the topic to be presented in a group session (includes journal club)</td>
<td>Mean - Median Minimum Maximum Mode</td>
<td>9.62 – 5.00 0 (n=1) 80 (n=1) 4.00</td>
<td>5.42 – 3.00 0 (n=11) 72 (n=1) 2.00</td>
<td>15.04 - 8.00 1.5 (n=1) 128 (n=1) 8.00</td>
</tr>
<tr>
<td>B. Studying the topics presented by other groups (before the exam)</td>
<td>Mean - Median Minimum Maximum Mode</td>
<td>6.33 - 2.00 0 (n=38) 120 (n=1) 0.00</td>
<td>2.31 - 0.00 0 (n=125) 72 (n=3) 0.00</td>
<td>8.64 - 2.00 0 (n=34) 168 (n=1) 0.00</td>
</tr>
<tr>
<td>C. Preparing the “quiz” presented by the group</td>
<td>Mean - Median Minimum Maximum Mode</td>
<td>4.83 - 2.00 0 (n=20) 160 (n=2) 2.00</td>
<td>3.24 - 1.00 0 (n=29) 100 (n=2) 1.00</td>
<td>8.07 - 3.00 0 (n=6) 260.00 (n=2) 2.00</td>
</tr>
<tr>
<td>D. Specifically studying for the final written exam</td>
<td>Mean - Median Minimum Maximum Mode</td>
<td>32.39 – 24.00 0 (n=2) 150 (n=1) 10.00</td>
<td>6.62 - 2.00 0 (n=65) 78.00 (n=1) 0.00</td>
<td>38.91 - 30.00 0 (n=1) 222.00 (n=1) 5.00</td>
</tr>
</tbody>
</table>

TOTAL time of study = (A+B+C+D) = 53.07 - 38.50 17.59 - 8.00 70.66 - 48.75

Total workload in hours = = Total time of study + 28 = Mean - Median Min - Max Mode

Mean=98.66 - Median=76.75

Min=33.84 (n=1) - Max=636.00 (n=1)

Mode=58.00

(n = number of students with minimum or maximum hours, in each specific activity)
Table 2. Hypothetic allocation of ECTS credits to students successfully completing the Public Health study unit, corresponding to the workload estimates in hours, using two minimum threshold values per credit unit (25 and 30 hours)

<table>
<thead>
<tr>
<th>ECTS Credits</th>
<th>25h per credit (*)</th>
<th>No of students</th>
<th>%</th>
<th>30h per credit (#)</th>
<th>No of students</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>[ 25 – 37.5 ]</td>
<td>00</td>
<td>0.0</td>
<td>[ 30 – 45 ]</td>
<td>09</td>
<td>4.7</td>
</tr>
<tr>
<td>1.5</td>
<td>[ 37.5 – 50 ]</td>
<td>19</td>
<td>10.0</td>
<td>[ 45 – 60 ]</td>
<td>42</td>
<td>22.1</td>
</tr>
<tr>
<td>2.0</td>
<td>[ 50 – 62.5 ]</td>
<td>39</td>
<td>20.5</td>
<td>[ 60 – 75 ]</td>
<td>40</td>
<td>21.1</td>
</tr>
<tr>
<td>2.5 (&amp;)</td>
<td>[ 62.5 – 75 ]</td>
<td>33</td>
<td>17.4</td>
<td>[ 75 – 90 ]</td>
<td>31</td>
<td>16.3</td>
</tr>
<tr>
<td>3.0</td>
<td>[ 75 – 87.5 ]</td>
<td>29</td>
<td>15.3</td>
<td>[ 90 – 115 ]</td>
<td>21</td>
<td>11.1</td>
</tr>
<tr>
<td>3.5</td>
<td>[ 87.5 – 100 ]</td>
<td>12</td>
<td>6.3</td>
<td>[ 115 – 130 ]</td>
<td>15</td>
<td>7.9</td>
</tr>
<tr>
<td>4.0</td>
<td>[ 100 – 112.5 ]</td>
<td>10</td>
<td>5.2</td>
<td>[ 130 – 145 ]</td>
<td>09</td>
<td>4.7</td>
</tr>
<tr>
<td>4.5</td>
<td>[ 100 – 112.5 ]</td>
<td>15</td>
<td>7.9</td>
<td>[ 145 – 160 ]</td>
<td>06</td>
<td>3.2</td>
</tr>
<tr>
<td>5.0 +</td>
<td>125 +</td>
<td>33</td>
<td>17.4</td>
<td>160 +</td>
<td>17</td>
<td>8.9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>[ 33 – 634 ]</td>
<td>190</td>
<td>100</td>
<td>[ 33 – 634 ]</td>
<td>190</td>
<td>100</td>
</tr>
</tbody>
</table>

(*) Minimum of 25 hours for the first ECTS credit unit and 12.5 additional hours for each 0.5 units.
(#) Minimum of 30 hours for the first ECTS credit unit and 15 additional hours for each 0.5 units.
(&) The actual value credited to all students was 2.5 ECTS credits.

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