
Graphical representation of assessments in a medical curriculum

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Abstract

The graphical representation of the assessments in a medical curriculum is useful to all the stakeholders of the curriculum. The graph can be constructed using the academic years as the horizontal axis and the percentage of the maximum final score for each academic year as the vertical axis. Punctuated and continuous summative assessments are shown as vertical and slanting segments on the graph respectively. Horizontal segments indicate no summative assessment. Dotted whiskers represent either formative assessments or summative assessments that do not contribute to the yearly final score. Such a graph provides a visual overview of all the assessments in a curriculum. The MBBS curriculum at the University of Hong Kong is used as an example to illustrate the construction of the graph.

Introduction

An overview of assessments in a curriculum would be useful to the different stakeholders, such as the students, who will know when and how they will be assessed; the teachers, who will know their individual contribution to the overall assessment; and the public, who will know that the quality of the program's graduates is ensured through appropriate assessments. While a curriculum map can provide an overview of a curriculum (Harden, 2001), there has been no satisfactory method to give an overview of the assessments in a curriculum.

In this paper, we report a method of representing the assessments in a medical curriculum on a graph, so as to provide a visual overview of their temporal arrangement and relative contributions. The Bachelor of Medicine and Bachelor of Surgery (MBBS) curriculum at the University of Hong Kong (HKU) will be used as an example (Figure 1).

The curriculum is five years long and is summarized in the lower part of Figure 1. The blocks in junior, senior, and specialty clerkships are shown in an order that only some students will go through. The other students will complete the same blocks but not in the depicted order.

Method of construction of the graph

A. Axes

The horizontal axis is the time axis, measured in academic year. The MBBS curriculum at HKU can thus be represented by five equal intervals on the horizontal axis (Figure 1). The vertical axis is the percentage of the maximum yearly final score for each academic year (Figure 1), which is set at one hundred percent per year. This one hundred percent results from all the summative assessments that take place within that year and, by definition, does not include formative assessments.

In the MBBS curriculum at HKU (Figure 1), the first hundred percent on the vertical axis results from all the summative assessments in the first year, the second hundred percent from those in the second year, and the third hundred percent from those in the third year. However, there is no yearly final score for the fourth year, since the specialty clerkship spans the fourth and fifth years. The maximum final score at the end of the fourth and fifth years is thus two hundred percent.

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B. Segments

The graph consists of solid segments, which form the body of the graph, and dotted whiskers, which branch out from the body (Figure 1). The graph shows how different assessments are temporally arranged to give rise to the maximum final score (one hundred percent) for each academic year. The graph represents the temporal pattern and relative contribution of all the assessments in the medical curriculum.

A horizontal segment (e.g., segments 1.1, 3.1, and 5.6 in Figure 1) on the graph represents a part of the curriculum without summative assessments. Such a period makes no contribution to the yearly final score (no summative assessments).

A slanting segment represents a continuous summative assessment that contributes to the yearly final score. The horizontal extent of such a segment is the period covered by the continuous assessment. The vertical extent is the percentage contribution of that continuous assessment to the yearly final score. For example, during the three system blocks in the later part of the first year of the MBBS curriculum at HKU, the students are being continuously assessed in all PBL sessions. This continuous assessment constitutes 35% of the yearly final score for the first year. Therefore, segment 1.2 for this period of the curriculum is a slanting segment, with a horizontal extent equal to the time of the three system blocks, and a vertical extent of 35% on the vertical axis.

A vertical segment can be considered as a slanting segment with a negligible horizontal component, i.e., an assessment that takes place within a very short time of, say, a few hours to a few days. The height of the segment is equal to the percentage contribution of that assessment to the yearly final score. Such an assessment is called a *punctuated assessment* here, as it takes place at a particular point in time, instead of over a period of time as in continuous assessment. For example, at the end of the first year in the MBBS curriculum, there is an assessment that takes place within a few days and constitutes 65% of the yearly final score of the first year. Therefore, segment 1.3 is a vertical segment at the end of the first year, with a height of 65% on the vertical axis. Some vertical segments, such as segment 3.3 (not labeled in Figure 1, between segments 3.2 and 3.4), are very short because of the very small contribution they make to the yearly final score.

C. Whiskers

Assessments that do not contribute to the yearly final scores are indicated on the graph by dotted whiskers, i.e., branches from the body of the graph (Figure 1). Some assessments are formative and do not affect the promotion or graduation of the students. However others are summative in nature as students need to pass them to be promoted to the next year or to graduate, even if they do not contribute to the yearly final score.

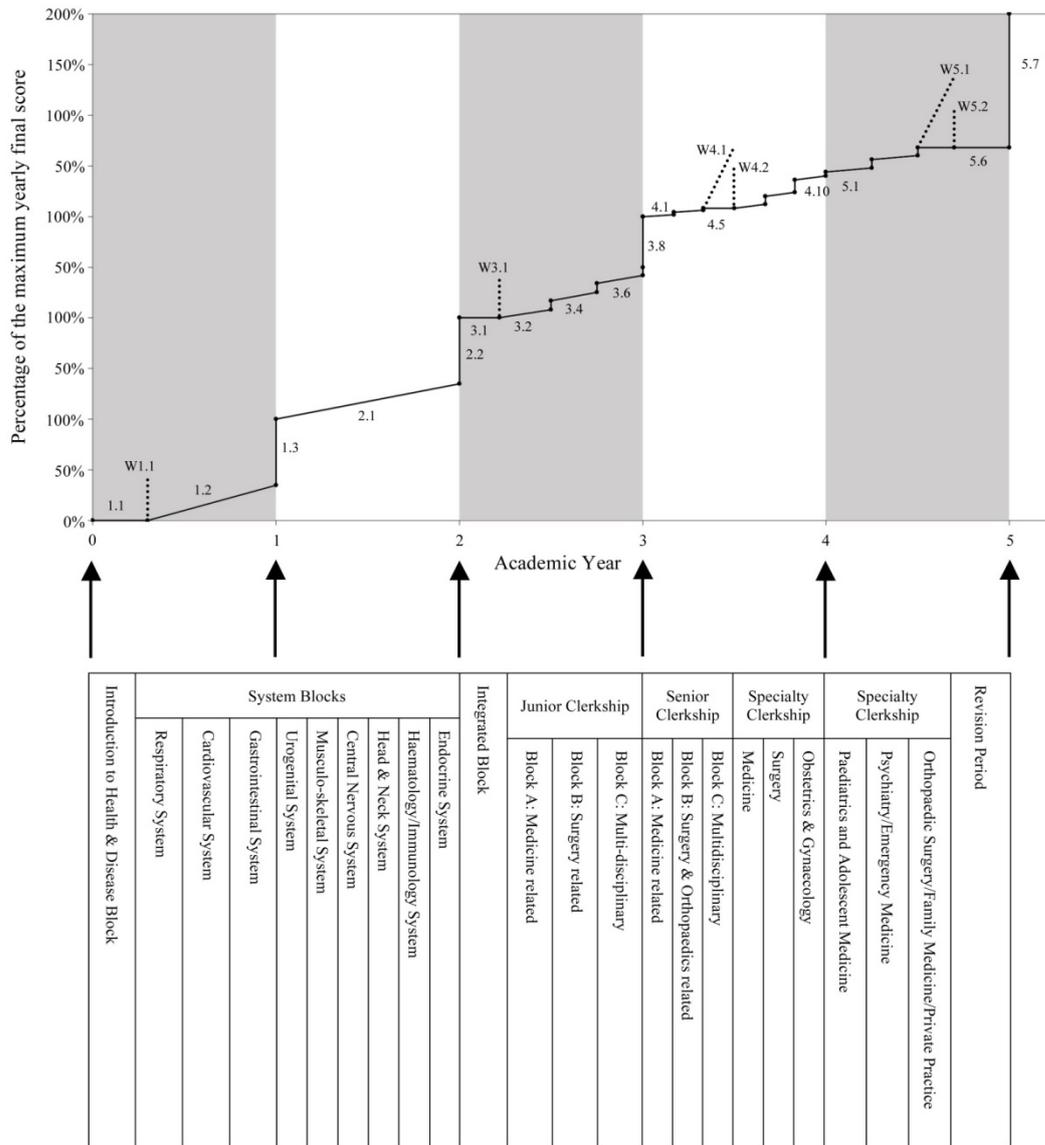
Vertical whiskers represent punctuated assessments that do not contribute to the yearly final score. Their height is arbitrary and bears no relationship to the yearly final scores. For example, whisker 1.1 (Figure 1) is a formative assessment that takes place after the Introduction to Health and Disease Block in the first year. This assessment does not count towards the first year final score and a student's performance, in that it does not affect his or her promotion through the curriculum. Whisker 4.2, representing the assessment at the end of the Multi-disciplinary Block in senior clerkship, is a punctuated assessment. Although it does not contribute to the yearly final score, each student has to pass it in order to move on to the next block. This assessment is thus still summative in nature.

Slanting whiskers represent continuous assessments that do not contribute to the yearly final score. Strictly speaking, this kind of assessment should be represented by horizontal whiskers (no vertical components), but horizontal whiskers are very difficult to show on the graph because they may overlap with other segments. Thus slanting whiskers are used. The horizontal extent is the period covered by that continuous assessment. The vertical component is arbitrary and bears no relationship to the yearly final score. For example, whisker 4.1 represents the continuous assessment during the Multidisciplinary Block of the senior clerkship. Its horizontal extent is the length of that block, but its height is arbitrary. Although this assessment does not contribute to the yearly final score, students must pass it in order to move on to the next part of the curriculum. It is thus summative in nature. Whisker 5.1 is another similar example.

References

Harden, R.M. (2001) AMEE Guide No. 21: Curriculum mapping: a tool for transparent and authentic teaching and learning, *Medical Teacher*, 23(2), pp. 123–137.

Figure 1: Assessment graph for the MBBS curriculum at the University of Hong Kong



- Not all segments are labeled. In each segment label, the number before the full stop indicates the academic year, while the number after the full stop indicates the position of the assessment in that year. Whiskers are labeled with numbers preceded by the letter 'W.'