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SPECIAL ARTICLE

Conventional and electronic portfolios in medical residencies[☆]

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Abstract Portfolio is a new tool that gathers evidence of knowledge, abilities, attitudes, and values. This form of evaluation has arisen in the context of a competency based learning and evaluation. Conventional portfolios can be mainly divided in summative and formative. Summative portfolio can evaluate the final learning product of the student and formative portfolio can guide the student through the learning process with various evaluations. Also, electronic portfolios have increased the range of evidences that can be added to the portfolio, is highly accessible and is more agreeable to students. Recommendations are made on how to start and maintained a portfolio in medical residencies.

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Portafolio convencional y electrónico en las residencias médicas

Resumen El portafolio es una nueva herramienta que recopila evidencia de conocimiento, habilidades, actitudes y valores. Esta forma de evaluación ha surgido de la necesidad de un aprendizaje y evaluación basados en competencias. Los portafolios convencionales se dividen principalmente en sumativos y formativos. El portafolio sumativo evalúa el producto final del estudiante y el portafolio formativo guía al estudiante a través del proceso de aprendizaje mediante numerosas evaluaciones. Además, el portafolio electrónico incrementa el rango de

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evidencias que pueden ser añadidas, es altamente accesible y cuenta con una gran aceptación por parte de los estudiantes. Se realizan recomendaciones de cómo empezar y mantener un portafolio en las residencias médicas.

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Introduction

By definition, competency-based learning involves acquiring a combination of cognitive, sensory, and motor competencies and abilities. This type of education developed based on the needs resulting from modernization and industrialization. Previous educational models focused exclusively on knowledge acquisition and not on performance.^{1,2}

The curricular advances that are being made around the world are impossible to ignore. In addition to modifying to competencies, programs, and objectives of courses, evaluation methods should also be updated. We will not reach the educational forefront if courses continue to be evaluated as they have been traditionally. We are approaching an educational revolution that represents a fundamental change in the way that we teach and evaluate.

In our path toward comprehensive competency-based learning in which the teacher participates not only as a trainer of independent students but also as a facilitator of self-teaching, new tools of measurement and evaluation are fundamental.¹⁻³ The portfolio is a new tool that can encourage reflection and self-evaluation, in addition to being a collection of evidence of learning and experiences.^{4,5} As portfolios can be either physical or electronic, both modalities are addressed in this work.

It is therefore important to discuss evaluation, which is defined as an act that gathers data of a person, deed, situation, or phenomenon to deliver an evaluative judgment.³ Various authors have expressed that the solitary performance of the traditional exam is insufficient as the final evaluation of a student.^{1,2} Nevertheless, despite this shift in the literature, exams remain the only form of evaluation in the majority of graduate programs; thus, it is crucial to make progress in creating new evaluation processes, particularly at the graduate level.

A portfolio can be valuable when it is used to evaluate a graduate student. However, a portfolio is a tool that remains under-utilized in graduate medical studies and in graduate programs in general. A portfolio can be used when students are expected to attain more than theoretical understanding of a subject; in other words, portfolios are particularly useful when the educational goal is to shape abilities, competencies, analysis, deep understanding, and a reflection of the learning process, among other things.^{4,5} Notably, comprehensive evaluation of student performance is often critical, particularly in a competencies-based curriculum.²

In addition to being heterogeneous and dynamic, a portfolio can be an instrument for teachers' reflection and students' self-reflection.^{2,5} It accumulates evidence of performance and allows for this evidence to be properly

considered,^{4,5} particularly evidence regarding whether a student has acquired the competencies required by a specific course. Significant learning arises from critical analysis and reflection.^{1,2}

The basis for the use of portfolios emerged from pedagogical constructivism.¹ This foundation is based on the acquisition of a new understanding through analysis and by reflecting on previous knowledge, with its subsequent application to new and diverse situations. Along with pedagogical constructivism, a comprehensive evaluation of learning allows us to evaluate, analyze, reflect, and act on learning objectives. In other words, to perform a formative evaluation.² Thus, a portfolio may be the ideal tool to engage in this evaluation and improve student learning.

Portfolio

Portfolios began to be employed in pedagogy in 1980 and were initially used by architects, photographers, designers, etc. In 1991, Paulson wrote that the portfolio is a collection of student works that reflects the progress, effort, and achievements of an individual. Portfolio and electronic portfolio is the recollection of evidence of individual development, evaluation, student motivation and self-assessment.⁴

Thistlethwaite⁵ described portfolio as a collection of documents that provides proof of learning and a reflective analysis of the documented events. The portfolio should show that the collector has acquired the necessary competency level in his/her training.

A portfolio can apply both to teachers and students. Universities can use portfolios to document teaching and learning in graduate programs.

There are various types of portfolios,² including:

- Work portfolios: general and deliberate collections of evidence that show that the student is meeting the objectives of a specific project;
- Exhibition portfolios: selections of best works; and
- Diagnostic evaluation portfolios: documentations of learning that facilitate feedback on a student's performance.

Portfolios aggregate the evaluation of knowledge, abilities, attitudes, and values. In addition, they create a dynamic learning environment because they also allow for self-evaluation. Both professors and students can self-evaluate based on the results presented in portfolios.

Portfolio learning can be understood as a type of experience-based learning. According to Rodríguez-Weber,⁶

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