

How can we make Osteopathic Research enjoyable for undergraduate students? Let's implement Team-Based Learning in our pedagogical pathways!

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1 Defining educational objectives

We upgraded our courses "Research & Osteopathy" using a pedagogical strategy with a modified **TEAM-BASED LEARNING** (Parmelee et al., 2012).

A **HIERARCHICAL ORGANIZATION** of educational objectives was tailored to certified credit level descriptors according to the academic levels required by the accrediting Institution (Quality Assurance Agency for Higher Education, 2008):

- General
- Intermediate
- Specific

TAXONOMY LEVELS were drafted following the 6-points structure of the cognitive process dimension of the "Revised Bloom's Taxonomy" (Krathwohl, 2002).

2 Planning an evaluation system

The evaluation system was composed of 4 summative kinds of assessments:

- 1) INDIVIDUAL READINESS ASSURANCE TEST (iRAT).** At the beginning of each face-to-face lesson, students completed 10 multiple choice questions.
- 2) TEAM APPLICATION PROJECT (tAPP).** Students worked as a research team to produce a study protocol: reliability study or randomized controlled trial.
- 3) PEER EVALUATION.** Each student anonymously evaluated all teammates on their contribution to the team's success.
- 4) REFLECTIVE ASSESSMENT.** Each student was required to produce a written reflection about his/her first experience in the field of research using the Gibbs' Reflective Cycle (Paterson and Chapman, 2013).

Guilbert's educational planning spiral

4 Implementing evaluation

As a tool to evaluate training outcomes, we relied on the **KIRKPATRICK MODEL** and its 4 levels (Smidt et al., 2009):

- 1) REACTION.** Anonymised quantitative questionnaires were used to evaluate students' feedback about course enjoyment.
- 2) LEARNING.** Students' level of learning was established following a grading scheme to generate an objective end-of-course evaluation expressed in percentages: iRAT 30%, tAPP 30%, peer evaluation 5%, reflective assessment 35%.
- 3) IMPACT.** Our Research Department is still gathering data to assess this point.
- 4) RESULTS.** This educational reform produced positive results for our Institution, since the great optimization of human resources in the Research Department, with 54% decrease in-class teaching hours.

3 Preparing & implementing an educational programme

FLIPPED CLASSROOM (Tolks et al., 2016) perfectly matched our student-based learning institutional mission and our educational objectives, alternating asynchronous original webinars and synchronous project-based lessons.

This **CONSTRUCTIVIST APPROACH** (Biggs and Tang, 2011) showed to be:

- a) effective** in pre-clinical healthcare stage (Kühl et al., 2017) to develop critical thinking and problem solving according with the Cone of Learning Framework (Letrud and Hernes, 2018);
- b) supportive** in the identification of criticalities in the class (Sandrone et al., 2020);
- c) suitable** for millennials and "Gen Z" students (Shatto and Erwin, 2017);
- d) consistent** with academic project-based courses (Tiwari et al., 2017).