Cognitive Wrappers: Metacognition And Reflection Tools To Learn How To Learn
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Overall goal
At Creighton, the goal of personal growth of our students encompasses the nurturing of life-long learners. To this end and within the framework of the Ignatian pedagogy paradigm, I use “cognitive wrappers” to challenge students to appropriate their own process of learning.

The tool
“Cognitive wrappers” are effective tools that focus on using metacognition and reflection skills to get students to analyze the factors that contribute to their performance in course exams (general physics 2xx courses) and plan strategies that will strengthen their study habits to improve their exam performance.

The fluid form asks students about:
• How much time students invested in preparing for the test, discriminated by resources they used.
• Sources of errors in the exam, discriminated by type of error.
• Strategies that students feel were successful in their preparation.
• Strategies (good study habits) that students are willing to implement.
• Suggestions students may have for the instructor

Logistics of the tool
• I distribute the form to the students after the first or second exam in the semester.
• I collect the forms and assign full score if the form is completed thoughtfully.
• I provide overall feedback to the class as a whole.

Overview of the student population
I use the tool with general physics students (formerly PHY 211 and PHY 212, currently PHY 202 and PHY 206).

Cognitive wrappers usefulness
1. How students perceive they prepare for a physics exam
   • About 1/3 of the students do not re-read the textbook.
   • Most students emphasize reading my handouts, their notes and the homework problems.
   • Few students do more problems.

2. What students reflect on
   • Students assume responsibility of their learning process.
   • Students realize that understanding implies stronger grades and less anxiety about the exam.
   • Students confront their pre-conceptions: understanding physics is different from doing the math to get an answer.
   • Students realize the sources and strategies that are more effective for their own learning.
   • Students reflect on their time management skills.
   • Students choose good study habits they would like to implement for the following exam.
   • Students analyze what they perceive as the source of their mistakes in the exam.

3. How well I reach out my students
   • I establish another means of communication and timely feedback with students.
   • The students’ learning style and student-instructor connection become evident: Dichotomic comments such as:
     ~Dr. Soto is very available in her office" and ~I wish she were more available to answer my questions”.
     ~I like how she explains all equations” and ~I wish she explained the equations we use”.
   • I get to know the level of thoughtfulness of students and awareness of their learning process.

Plans for the near future
• Correlate student techniques to prepare for a physics exam at the beginning and end of the course with demographics descriptors to test whether progression in exam preparation is influenced by major, year, and gender.

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