

# Tareas calificadas por los compañeros: Evidence-based teaching strategy

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## Algorithms course

Enviado el 22 de diciembre de 2020

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### CUADRO DE AVISO

1. Context - Begin by describing the problem. Please include a brief description of what you teach (topic, level, class size, etc.)

Next semester i'll be a teaching assistant for the algorithms course at my university, right now i'm an undergraduate computer engineering student. Because i already took the course and i know the proffesor, i'll be analyzing his class with the idea of helping him improve the class.

#### Course data

Topic: Algorithms

Level: undergraduate (major in computer engineering and major in computer science)

Class size: 30 students

#### Problem

The professor who teaches the course is highly educated (Phd) and is also kind and fun, anyway he has a strong lack of organization and even through the students get high grades (because he makes easy exams), most students complain after taking the course because of the fact that teaching is not effective.

for example the course topics plan was:

1. Python's Scientific Computation Ecosystem
2. Competitive Programming
3. History of Algorithms
4. Top 10 algorithms of the 20th century and algorithms in the news
5. Computational Thinking
6. Programming Languages
7. Pancakes With A Problem!
8. New Markets: The Invisible Hand of Algorithms
9. Analysis of Algorithms
10. Brute force - Complete Search - Backtracking
11. Asymptotic Notation
12. Incremental/Decremental Paradigm
13. Greedy Algorithms
14. Divide and Conquer
15. Dynamic Programming

some problems i find in this list are that topics could be learned better with a different order and that 11 is already covered in 9, and 7 and 8 were problem applications of other topics, so it would be better to remove them from the syllabus because they are confusing without very specific context.

Also the main issue was that the proffesor during the course added new unplanned topics (for example montecarlo simulations) and began explaining the planned topics faster. With the previous i do think that organization or planning was not well made.

Similarly, explanations given in class were sometimes not good because the proffesor didnt knew the student's level of knowledge and either explained the topics superficially without diving deeper into theory and grounds, or assumed that the previous knowledge of the group was high and skipped some facts that would be nice to review. This lack of clarity was a problem to achieve learning.

### CUADRO DE AVISO

2. Intervention - Describe how you would implement the evidence-based teaching practice to improve the problematic situation. What would it look like in your teaching space when you implement this strategy? (You could describe your actions, students' actions, the set up of the room or of an activity, etc.)

The evidence-based teaching practice i would apply is instructional clarity. I would apply the following changes

#### STRUCTURE

At the beginning of each class i would say which are the class objectives and also i would define a highly detailed structure, which would be as follows:

evaluation criteria and reorganize the syllabus as follows

1. History of Algorithms
2. Computational Thinking
3. Programming Languages
4. Introduction to Python
5. Famous algorithms
6. Analysis of Algorithms
7. Algorithm programming paradigms
  - a.Brute force – Complete Search – Backtracking
  - b.Incremental/Decremental Paradigm
  - c.Greedy Algorithms
  - d.Divide and Conquer
  - e.Dynamic Programming
8. Competitive Programming

#### CONTENT

- Every class i would spend some short time making a review of the necessary previous concepts for understanding the class new topics.
- i would try to construct or derivate mathematically the new ideas to show the students how rigorous, truth and important they are, also i would use analogies to keep the concepts easy to understand.
- i would recommend at the end of each class online or text resources to learn better the studied topics

These actions depend mainly on the professor, the role of students and their participation are also important but i'm not sure how to improve interaction using instructional clarity.

#### CUADRO DE AVISO

3. Student learning - How would you know if this modified teaching strategy will lead to an improved learning outcome for your students?

i think that the pruposed changes would be positive because a new syllabus and clear class objectives every session could help understand what we are supposed to learn and which skills we must acquire. Trying to improve the clarity of explanations and attending the questions that appear in class would be a support to student's learning too.

for knowing the degree of success of these changes i would use strategies of formative assesment to verify that the students are understanding, especifically i would make quizzes asking to explain shortly the class content and i would also call random students and ask them conceptual questions. Also i would ask the students about which part of the class was the hardest and explain it again briefly.

#### CUADRO DE AVISO

4. Reflection - How is the teaching you have described in this assignment different from how you usually teach or how you were taught as a student?

The pruposed teaching would be better than the teaching i had when taking the algorithms course because

1. complete course and each class objectives are clear
2. The order of topics is more logical and intuitive
2. professor's explanations are introduced without assuming a high previous knowledge and try to be complete but also easy to understand. Questions are welcomed and stimulated to improve understanding too.

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#### Comentarios

Solo el estudiante puede ver comentarios que se dejan para ese estudiante y la persona que dejó el comentario.



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