

# The influence of early childhood student teachers' beliefs on their intention to use inquiry-based learning methods

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## INTRODUCTION

**Context:** Inquiry-based teaching and learning environments (NGSS, 2013), for Instance Control of Variables Strategy (CVS) (Chen and Klahr, 1999)

**Actors:** Teachers of early childhood education

**Expected behaviour:** Conscious and at the same time effective use of these environments only if

**Prerequisites:** Studies at the pedagogical departments, in the context of innovative exploratory environments (Han et al., 2017).

**Theoretical Framework** of the study: Theory of Planned Behavior (Ajzen and Fishbein, 2000)

## AIM

**Research focus** on student teachers':

- Understanding of CVS as a result of a six-month inquiry-based course
- **Beliefs** regarding the CVS method, that could possibly influence their
- **Intention** to integrate the method into their teaching practices

## METHOD

**Participants and context:** A six-month laboratory, inquiry-based course on science education (N=81), in a Department of Early Childhood Education, in Greece

**Phenomena negotiated:** floating / sinking, magnets and air properties

**Teaching approach:** experimental and explicit introduction to the reasoning of the CVS method

**Methodological framework:** Theory of Planned Behavior (Ajzen & Fishbein, 2000). Specifically: Student teachers' **intention** to use the CVS method in their teaching, in the first school year they would teach could be affected by **four factors**:

1. the attitude factors towards involvement (personal gains and losses),
2. the normative factors (opinions of significant others),
3. the control factors of involvement (evaluation of personal abilities), and
4. the views of student teachers, related to the learning gains that the children will obtain from the instruction

**Research questions:**

**RQ1.** What is student teachers' understanding of CVS method as a result of the six-month inquiry-based course?

**RQ2.** What is the intention of student teachers to use the CVS method when planning and implementing teaching scenarios for science education issues in the first school year they will teach?

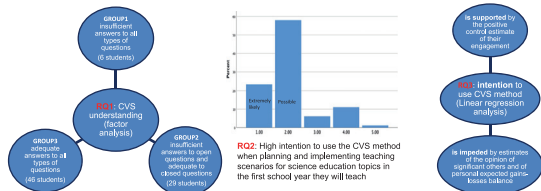
**RQ3.** How is their intention to use CVS method affected by the four factors of the methodological framework?

**Data collection:**

**CVS method's understanding:** a **questionnaire** comprising 8 questions (4 open- and 4closed-ended) aiming to bring the student teachers face to face with problems/questions, the solution of which requires the management of more than one variable

**Intention to use the CVS method:** an Ajzen & Fishbein (A&F) **questionnaire** comprising 36 closed questions (5-point Likert)

## RESULTS



## CONCLUSION

The understanding of the CVS method occurs:

- a) as a **simple rule** of managing already predefined specific variables (rule: change one variable and the others remain constant), and
- b) as a **more complex process** of simultaneous management of several variables to build complex hypotheses and then using the CVS method.

Regarding **student teachers' education on scientific practices**, it appears that:

- a) CVS method, **firstly** as a simple rule, **afterwards** as an ability to build a complex hypothesis,
- b) CVS method's understanding **could create expectations** of adequate control of a future teaching in early childhood education;
- c) A teaching which, however, is expected to **personally exhaust** the teachers and bring them face to face with significant others.

## KEYWORDS

Control of Variables Strategy,  
Theory of Planned Behavior,  
Early Childhood Education

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