SUCCESSFUL EXPERIENCES USING IPAD AS A CHEMISTRY LEARNING TOOL

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Introduction

• In last years, crisis on science education has led to an increase in the use and research on ICTs.

• Most experts agree with the implementation of ICT in Science Teaching which develops intellectual skills and help teachers training.

• Mobile technologies in the classroom (iPad and tablets) allows the use of educational tools everywhere and every time.

• Some methodologies, as PBLs (Project Based Learning) and collaborative learning, are increased its efficiency with the ICT resources.
Using IPad in Chemistry lessons

Work environment description

• Our school: a secondary school placed in Granada, Spain.

• Our students use iPads in classroom since 2013 at 1st and 2nd levels of Upgrade School (16-18 year-old students).

• I will describe two activities using Ipad developed with a 35 students’ group from 1st course of Upgrade School in the subject “Physics and Chemistry”.

• I will show the evaluation of one of the two activities.
Using iPad in Chemistry lessons

Working with a molecular visualization app.

- The app that students worked with is called *3D Molecules Edit&Drill*. With it you can create organic and inorganic molecules and visualize its 3D structure.

**Metodology:**

- This activity was carried out at the end of the didactic unit about organic chemistry and carbon compounds.

- Small groups with 3-4 students elaborated models in 3D of organic molecules based on their previous knowledge and their designs were uploaded in a shared folder in Google Drive.

- The students shared their models, discussed the weak points and made changes in the data collected on the folder.
Using IPad in Chemistry lessons

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Results:

• It was possible to collect 3D models from 130 molecules (39 hydrocarbons, 71 oxygen-containing hydrocarbons and 20 nitrogenous hydrocarbons).

• 70% of the pupils who participated had positive marks in this activity

• This activity was positively assessed by 80% of students and the experience was qualified as “motivating”.

![Images of students using iPads in chemistry class]
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Working with online simulators.

Our students worked with three online simulators designed in Flash about the kinetic theory and the early gas laws (Boyle’s Law, Charles’ Law and Gay-Lussac’s Law).

Methodology:

• The didactic approach applied during the didactic unit was a traditional approach except in the contents about kinetic theory and early gas laws.
• The first and second applications was used instead of textbooks during the explanation of the contents about the kinetic theory and early gas laws.
• It was applied in two steps: 1) reading and visualization and 2) group discussion to share the most relevant aspects.
• The third application was used during a virtual laboratory session with small groups of 3-4 students.
• To evaluate the effectiveness of this methodology based on ICT applications, we set an exam and compared the results of both methodologies (traditional and ICT).
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Evaluation Results:

• We marked a control question (traditional approach) and a similar ICT question (new methodology) to compare them.
• We divided question results in A (good made), B (acceptable), C (wrong).
• Number of answers qualified with A and B for the ICT question is higher (80%) than control question (74,29%).
• Students with AA are about 22,86% (full agreement), while the pupils with AC and CA taken together account for 14,28% (low agreement).
Conclusions

• The introduction of IPad in science teaching, allows to work in small groups, facilitates the exchange of data and discussion enviroment.

• New technologies applied in the Science Classroom, can increase students’ motivation.

• Our students obtained higher qualifications with the methodological approach based on ICT than traditional teaching approach.

• Improvement of meaningful learning is helped by a non traditional teaching approaches and ICT resources applied together.
Thank you for your attention.
Grazie per l’attenzione.

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