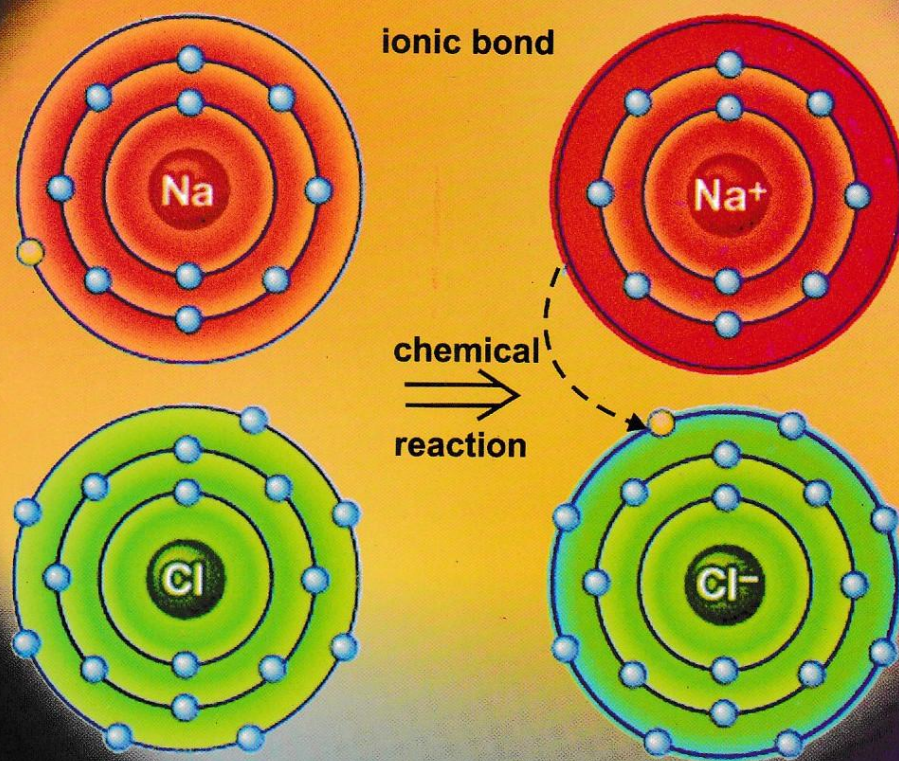


SCIENCE TEACHERS ASSOCIATION OF NIGERIA

CHEMISTRY PANEL

SERIES 13

CHEMICAL COMBINATION
& CHEMICAL REACTION



A HANDBOOK FOR CHEMISTRY TEACHERS

PAPER 6

FLIPPED CLASSROOM AS AN EFFECTIVE METHOD FOR TEACHING VALENCY OF ELEMENTS AND CHEMICAL FORMULA OF COMPOUNDS.

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Introduction

Chemistry learning can be incredibly fun and interesting when it is experienced creatively. This is only possible when the chemistry teacher is resourceful in the ways he applies ingenuity inline with the nature of the concept to be taught. Despite the availability of several teaching techniques like demonstration; laboratory techniques, guided inquiry, cooperative learning and availability of ICT tools, teachers in Nigerian secondary schools still make use of lecture method of instruction especially when they feel the concept cannot be demonstrated or experimented in the laboratory. Some abstract concepts like valency of elements cannot be taught by the use of experiments, hence, chemistry teachers basically make use of the traditional lecture method in teaching this concept and this makes the students bored and easily disengaged in the learning process. To keep learners attention going, teachers can add quizzes, drag and drop elements and other funs out of the bulk of elements to create appeal experiences or the students. The use of innovative ICT tools like flipped classroom sustaining students' interest and reducing their cognitive load therefore becomes necessary.

Flipped classroom is a simple way for teachers to adopt digital instructions. Teacher need simple tools like digital learning environments do make lesson understanding clearer.

Le-Mamer (2013) stated that students' today expect more from a classroom experience than a passive learning opportunity that consist mostly of one-way communication with limited student interaction. The flipped classroom responds to the needs of modern learning and provides an effective model of reinvention (Muhammed and Falalu, 2016). The flipped classroom is a pedagogical model in which short videos are viewed by students at home before the classroom session while the in-class time is devoted to exercise projects, class work and discussions (Bergmann and Sam, 2012). The video lecture is often seen as the key ingredient in the flipped classroom. such video lectures are posted online or selected from an online repository for the students to access (Muhammed and Falalu, 2016). In flipped classroom, students use technology at home, watch online instructional videos, demonstration and explanation of assignments, while the class time is spent in doing what is traditionally called "homework". The teacher is a learning facilitator, able to work one-on-one with students, clarify assignment and offer help as needed, class mates could work together on in-class assignments, engage in discussions or collaborate on projects (Tomlinson and Tinghe, 2006). Flipped classroom has to come in to play as a digital experience to captivate students in and outside the classroom.

An Illustrative Presentation for Valency and Chemical Formula Instruction Using Flipped Classroom

Steps to be Taken

(Outside Classroom Activities)

The concept of valency requires adequate planning and preparations to make the lesson effective.

1. Since there are many lecture videos on valency of elements and Chemical Formula, the chemistry

teacher should download and assess two or three instructional videos on valency of elements and Chemical Formula before making a choice on which to use for the flipped classroom instruction.

2. After getting the choice of the instructional videos to be used, the videos are sent to the class websites, in the absence of a class website, the instructional videos are sent to the students' social network sites like Facebook and Whatsapp.
3. The students are then asked to visit the class website and watch the instructional videos about three days before the in-class room activities. Students are motivated to watch the instructional videos two to three times to get themselves acquainted with the concepts.

These Activities Will Be Presented Using Instructional Videos

(In-Classroom Activities)

1. During the in-classroom activities, the students are first given problems and questions on the concepts of valency. The student are already familiar with the valency
 - (a) What is the valency of the following elements?
 - i. Sodium
 - ii. Aluminum
 - iii. Chlorine
 - iv. Nitrogen
2. They make attempts of writing the valency of the elements, the teacher only acts as a guide facilitator giving help as needed and clarifying complex issues.
 - Note: The main objective of the lesson on valency is for student to correctly write out formula of compounds.
 - Formulas of compounds are formed by exchanging the valency of the combining elements (usually a metal and a non-metal).
 - (b) Write the formula of the following compounds
 - i. Aluminium chloride
 - ii. Hydrogen flouride
 - iii. Aluminium oxide
 - iv. Water.

Conclusion

Flipped Classroom instruction enables students to take over the learning process to own knowledge. This way, students are empowered to pursue their interest in learning various concepts of Chemistry.

The teacher must be skillful in manipulating digital tools to vary lesson instruction. A concrete object to use is the laptop. A well prepared and articulated lesson plan can be marred if the teacher is unable to use the laptop effectively.

These suggested ways could be used for planning and preparing students on use of flipped classroom for understanding the concept of valency and chemical formula of compounds.

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