

KNOWING MY PERIODIC TABLE OF ELEMENTS

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TABLE OF CONTENTS

PRELIMINARIES	Page
Approval sheet	i
Acknowledgement	ii
Dedication	iii
Executive Summary	vi
Table of Contents	vii
List of Figures	ix
List of Tables	x
CHAPTER	
I	INTRODUCTION
Project Context	1
Statement of Objectives	5
Purpose and Description	6
Scope and Limitation	7
II	REVIEW OF LITERATURE
III	TECHNICAL BACKGROUND
Iterative Model	13
Requirements	15
Design and Development	15
Testing	16



Implementation	16
IV METHODOLOGY	
Project Plan	18
Project Team Assignment	19
Data Gathering Procedure	19
Instrumentation	20
V RESULT AND DISCUSSION	
Feature of the Game	24
Testing the Usability of the Game	40
VI SUMMARY, CONCLUSION AND RECOMMENDATION	
Summary	46
Conclusion	48
Recommendation	48
BIBLIOGRAPHY	49
APPENDICES	53
CURICULUM VITAE	67



Chapter I

INTRODUCTION

Project Context

Ask a child to picture “learning”, and the classroom and the teacher naturally come to mind. Classrooms, teachers, desks, paper, and pencil are all part of the traditional learning environment. Learning can be a daunting task for anyone, especially children and teens, whose attention spans are short, leading quickly to boredom and frustration. Add the analytical complexities of math and sciences, and what began as an unpleasant and difficult task can become downright, arduous and painful. At these ages their attention spans may be short, but the faculties of memorization and recall are generally the best they will ever be. Modern students have also had another distinct advantage: they grow up learning how to use computers and are typically not apprehensive about using them to learn.

The past century has supplemented and enriched traditional learning environment with new ways of presenting content for learning. Today, opportunities abound for learning through multiple media—from pictures, audios, videos, projectors, and computers.

Computers are one of the main sources of entertainment of almost everyone. One of the main sources of entertainment in computer is the computer games which are installed.



PC games, also known as computer games, are video games played on a personal computer rather than a dedicated video game console or arcade machine. Their defining characteristics include a lack of user control over the video-gaming hardware and software used and a generally greater capacity in input, processing and output.

Games specifically PC interactive games offer a unique structure to complement traditional teaching strategies and infuse teaching with energy, spark, innovative thinking and provide diversity in teaching methods. Games make learning concepts more palatable for students and supply learners with a platform for their creative thoughts to bounce around. Games encourage creative behavior and divergent thought and are excellent ice breakers. Games will often act as learning triggers inducing lively discussion on learning concepts among students following game play.

The proponents offer an interactive learning in the area of chemical periodic elements which is an interactive educational game they call “Knowing my Periodic Table of Elements” targeted mainly chemistry students from the Ilocos Sur Polytechnic State College Laboratory High School Junior High School from Grade 7, 8 to Grade 9 who study chemical periodic elements.

The Periodic Table of Elements is a tabular arrangement of the chemical elements, organized on the basis of their atomic number,



number of protons in the nucleus, electron configurations and recurring chemical properties. Elements are presented in order of increasing atomic number, which is typically listed with the chemical symbol in each box. The standard form of the table consists of a grid of elements laid out in 18 columns and 7 rows, with a double row of elements below. The Periodic Table of Elements was designed independently about the same time by two different scientists- Dmitri Mendeleev, a professor of chemistry in St. Petersburg, Russia (1869) and Julius Lothar Meyer (1830-1895), a chemistry professor in Tuebingen, Germany. Mendeleev's table differed from Meyer's in that he left spaces and predicted that elements with certain properties would be discovered. (Van Cleave J., 2011. <http://scienceprojectideasforkids.com/2011/mendeleev-periodic-table/>)

Knowing My Periodic Table of Elements educational game offers students several available study options, such as individual examination of each the chemical elements of the Periodic Table in a structured form, from a complete periodic table to a study page of a single element, fun games of three category- arranging the periodic table of elements on its proper arrangement, matching names and symbol, and guess the picture.

This interactive Table of Elements will guide and be a source when it comes to showcasing the basic elements and studying chemical



tendencies that are commonly used not only in the science of chemistry but other fields of science as well, at the same time have fun since it is an educational games. Students can easily acquire information, it brings new opportunities to access information, create rich technology-based environment and experience new and challenging educational games.



Statement of Objectives

The study aims to create and develop an interactive periodic table of elements with educational games for the students of Ilocos Sur Polytechnic State College Laboratory High School.

Specifically the study sought to answer the following:

1. to determine the teaching strategy of Ilocos Sur Polytechnic State College Laboratory High School teachers regarding on the subject chemistry specifically the Periodic Table of Elements.
2. to create and develop an interactive educational application of the Periodic Table of Elements.
3. to test the usability of the developed interactive educational application along,
 - a. Efficiency
 - b. Attractability
 - c. Controllability
 - d. Helpfulness
 - e. Learnability



Purpose and Description

The study developed is an interactive educational application of the periodic table of elements that extract information concerning individual elements with some sort of mini games and improve the traditional learning environment with the aid of the technology for the ISPSC Laboratory High School students.

The study will benefit the following:

Student(s) -improve the knowledge of the Ilocos Sur Polytechnic State College Laboratory High School Students regarding the Periodic Table of Elements by providing them a better learning environment equipped by the latest technology.

Teacher(s) - improve teaching techniques and encourage to use various assistive technologies such as computers in their classrooms.

Developer(s) - improve their skills in developing a system most especially on graphical related software's that will benefit others.

Future researcher(s) - provide guidelines or review of related literature in developing their system and serve as a basis for the future researchers.



Scope and Limitation

The study focused in developing an application of the periodic table of elements intended for Ilocos Sur Polytechnic State Collage Laboratory High School Santa Maria Campus students with the following features- an interactive lay out of the 118 elements according to their natural occurrences and group, display of detailed form for every element showing their origin, discoverer, uses etc. Display of some common representation of simple molecules electron distribution mnemonics, lay out of ions and charges. Three categories of mini educational games, first is the Fill the Elements a single level game that let the player fill the blank periodic table of elements with the correct element symbol. Second is the Picture Guess which composed of three categories- easy, average and difficult. Elements picture are guessed by the player. Lastly, the What's that Element where the player is challenged to match the name of the element to its symbol. The game is also composed of three categories- easy, average and difficult.

The game cannot make experiments, equation and cannot combine elements. The game can be only run through personal computers, laptops and smart phones with windows platform.



Chapter II

REVIEW OF RELATED LITERATURE

Educational games are explicitly designed with educational purposes, or which have incidental or secondary educational value. All types of games are used in an educational environment. Educational games are designed to help people to learn about certain subjects, expand concepts, reinforce development, understand an historical event or culture, or assist them in learning a skill as they play. Educational games are designed to teach humans about a specific subject and to teach them a skill. As educators, governments, and parents realize the psychological need and benefits of gaming have on learning, this educational tool has become mainstream. Educational games are interactive play that teach us goals, rules, adaptation, problem solving, interaction, all represented as a story. It satisfy our fundamental need to learn by providing enjoyment, passionate involvement, structure, motivation, ego gratification, adrenaline, creativity, social interaction and emotion in the game itself while the learning takes place.

Digital games

Games are built of sound learning principles. Games provide personalized learning opportunities. It can also provide engagement for learner and provide an environment for authentic and relevant assessment.



According to Salen and Zimmerman (2011) game is a system in which players engage in artificial conflict, defined by rules that results in a quantifiable outcome. A digital game, then further refines the definition by requiring the system to incorporate technology. Digital games are well suited to improve instruction and differentiate learning while also providing more effective and less intrusive measurement than traditional assessments.

According to Ke (2012) digital games can provide an opportunity for play through simulated environments, this games are not necessarily a distraction from learning, but rather can be an integral part of learning and intellectual development.

According to Dickey (2011) games are also built with clear goals and provide immediate feedback. This allows players to change their game play in order to improve their performance and reach their goals. The idea of immediate feedback is also prominent in good formative assessment processes. Student will improve their work when given constructive feedback.

4 Pics 1 Word

This is a word puzzle game created by LOTUM GmbH, available for free on Android and iOS. released in February 13, 2013 ,4 Pics 1 Word's gameplay is very simple, each level displays four pictures linked by one



word - the player's aim is to work out what the word is, from a set of letters given below the pictures. The game is said to follow the "freemium" model, although the game is free, and devoid of any in-game advertising, micro transactions are available to help the user progress through the game more quickly.

4 Pics 1 Word has received mostly positive reviews. PC Advisor gave the Android version 4/5, praising its entertainment value, but stating that the social aspect could be improved. Pocket-lint featured it as their "App of the Day" on the 25th February 2013, praising both its simplicity, and its social aspect. As of March 21, 2013, the game is ranked 4th out of all free iPhone apps and Android apps, according to AppData.

Guess the Element

Guess The Element is a great challenging game. It is a kind of puzzle game that the player can reconnect all the elements he or she knows in the box. Fresh interface and impressive functionality. Similar to some hit challenging games. You can track the performance of Guess The Element of every day across different countries, categories and devices. This is the ultimate chemistry to know all about the different types of elements. The best for teachers and students to interact with educational game.



Bookworm Adventures

A follow-up to the word-forming computer puzzle game Bookworm from PopCap Games. Released in November 2006, Bookworm Adventures combines the "create words from sets of letters" aspect of Bookworm with several elements of a role-playing video game.

There are three (3) game modes in the first game. The different modes are Adventure mode which is the main mode of the game. In the Adventure mode, the player solves the mystery of the Great Library, fighting the opponents in order. The Adventure mode contains three books. After the player completes the Adventure mode, they cannot replay the Adventure mode and must create a new player to restart. In Mini-games, players can play three different mini-games and aim for high score. This mode is unlocked after Book 2 in the Adventure mode is completed. In the Adventure mode, the player can play a pre-selected mini-game for rewards that can aid them in their adventure. The Arena mode is unlocked after completing the Adventure mode (defeating Book 3). Here, players can battle through all the bosses in a fast-paced action (instead of the Adventure mode's turn-based gameplay) except for certain bosses (Hydra, Sphinx, Professor Codex). There is also an addition of a timer bar above the grid; if it's filled, the enemy will attack whether the player is ready or not. At the opposite side, the player can do several attacks in-between the enemy's attacks by spelling words quickly.



Element Flash Cards

Element Flash Cards will give you an element and, depending on the selections you make below, you will have to supply the element's chemical name, chemical symbol or atomic number. Flashcards is based on the ground-breaking original app The Elements, turned into a powerful memory aid for those moments when you really need to know your elements. No distractions, just the facts: name, symbol, atomic number, group.

The Elements Flashcards is perfect for students revising for GCSEs, SATs, A-levels, or for anyone who just wants to check if they know the periodic table as well as they think they do. Sample some of the magic behind The Elements, one of the most exciting apps ever made. Challenge your knowledge of the periodic table. Identify chemical elements by their symbol alone. Test your knowledge of the groups in the periodic table. Drag and drop elements to their correct position on the periodic table. Identify an element from its picture alone.



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