Sci Triv: A Mobile-Based Learning Tool on Elementary Science Trivia using Rule-Based System

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Abstract— **Mobile phones are utilized broadly as a part of our regular lives giving us the opportunity to convey anyplace and at any time. In terms of mobile learning, we mean discovering that is done through portable gadgets, for example, cell phones and tablets. In this paper we present a mobile e learning tool for elementary students using rule based system. As PDAs and tablets turn out to be easiest to understand and powerful, they will have a tendency to replace desktop and note pad PCs. Trivias can improve memory that can recall things more quickly and keep retention for longer period of time. Mobile Learning in Trivia may help students to improve their brain to become smarter.**

Keywords- Mobile Leaning, Science, Trivia, improvement, rule-based

I. INTRODUCTION

Today, there are many reasons why students get poor grades, especially among Elementary School students. Here are some reasons that may affect their grades: Literally Issues, Organization Issues, Communication Issues, Attention/Focus Issues, Health Issues, Motivation Issues and Performance Issues (oxfordlearning.com, 2014)[1]. In United States of America, according to Stephanie Pappas, gathered from a new Department of Education report, "two-thirds of fourth-graders and four-fifths of high-school seniors fail to reach proficiency levels in science."

Lack of Science Laboratories in Elementary and High School is the serious problem here in the Philippines based on Department of Education report. On the 5th day of March 2015, K to 12 was fully implemented in the Philippines. Some educators might not be fully ready for this basic education. Based on The Manila Times, "The execution of the K to 12 Fundamental Instruction Project does not look good for science education. Science education will begin just at Grade 3, which is not comforting for the improvement in basic science and math education."[2] This article tells that Grade 3 students are not ready or comfortable in science education because of their early age. To which some educators must be able to create some teaching techniques designed to help their students cope with the lessons and for them to be more comfortable with their subjects.

With expanding quantities of individuals getting to the internet utilizing mobile phones, Mobile-based learning helps students to study at home. It targets on the mobility of the learner, communicating with portable technologies. It is an informal learning to apply mobile tools for establishing learning tools and materials turn into an important part. It is usable from virtually anywhere to use mobile learning. According to the 2012 ECAR survey, mobile technology in general, including tablets, is the aspect of information technology that students are most interested in [3]. The students enhance to learn or discover many things in their study in home or in school. According to Muller, Sancho Gil, Hernandez, Giro, and Bosco 2007 "Simply placing technology hardware into classrooms will not bridge the digital barrier, though a plethora of well-meaning projects are bringing computers, connectivity, or other technology to rural schools."[4] It targets a cheerful stabilization of knowledge and the commitment of students using the gamification approach and its game mechanics.

The aim of this paper is how students learn while playing their mobile phones. This system has database to store collections of items which will be used by rules. More exertion may go into the outline and usage of the client interface than in the expert system knowledge base. Rule Based Expert System is used for being a way to store, manipulate knowledge and to interpret information in a useful way. They are often used in artificial intelligence applications and research. Also it is a set of "if-then" statements that uses a set of assertions, to which rules on how to act upon those assertions are created. While in software development, rule-based systems can be used to create software that will provide an answer to a problem in place of a human expert. Rule Based has modular nature that allows exemplify knowledge of the expert system done in simple way. Rules make it simple to clarify the structure of information to the expert system.

II. STATEMENT OF THE PROBLEM

Nowadays, we can't deny the fact that technology has a great impact and effects on youths including those who are

elementary students. Technology can be very helpful in their studies because they can easily search the answers of their homework and study and learn all of it. They can watch educational videos on YouTube, and can interact online if their school supports social learning networks. On the other hand, technology has negative effect on studies of Elementary students if they will use it in a wrong way or if they abuse the power of it. According to an infographic published by Everyday Family, 54 % of 21st century kids start using mobile devices when they are 5 to 8 years old [4.5]. In this early years of age, parents should guide them to use technology in a proper way otherwise their kids will end up abusing it by spending most of their time in playing online/offline games, interacting in different social medias especially Facebook. As stated before, Technology can be used to help students including Elementary ones. So, researchers may have develop an application that will help the Elementary students in their study specifically in their subject Science.

III. OBJECTIVES

The purpose of this study is to entertain and loosen up the students to think precisely and not to affect their brains to enhance their knowledge and to gain lots of new things. This proposal has explore other things that we can through. All of these trivia helps us to remind the previous topic. This research can also be used in many ways not just only in students but most of all who is interested what is in science all about. Also, to challenge the students to easily recall information, improves skills and helps in their science subjects.

IV. RELATED WORKS

(A Review of Research on Mobile Learning in Teacher Education [5]) This research exhibit the subjective combination of quantitative and subjective examination meant to address patterns and crevices saw in the writing with respect to the mix of portable learning into instructor training. Six main findings emerged: (a) there is an increasing trend in integrating mobile learning in teacher education contexts; (b) theoretical and conceptual perspectives are scarcely reported; (c) variations exist in perceptions, attitudes and usage patterns; (d) engagement with mobile learning and devices is primarily reported as being beneficial; (e) challenges were scarcely reported; and (f) several pedagogical affordances support mobile learning integration into teacher education settings. These findings have been interpreted to determine their implications on the development of mobile learning experiences in teacher education, including programmatic directions for integration and study. Same with this study the researchers target is to help the students to understand science in the use of Mobile learning.

(From Research and Development to Mobile Learning: Tools for Education and Training Providers and their Learning [6]) The m-learning task included four years of arranging, innovative work in addition to reflection and expansive scale trials of portable learning frameworks and learning materials with difficult to-achieve learners in different circumstances in three European nations. This research aim to apply the mobile learning for the use of easy learning. To also use this mobile learning as a toolkit for teaching. Same to this research the researcher aim to use this study as a toolkit also in science to help those student in learning science.

V. CONCEPTUAL FRAMEWORK

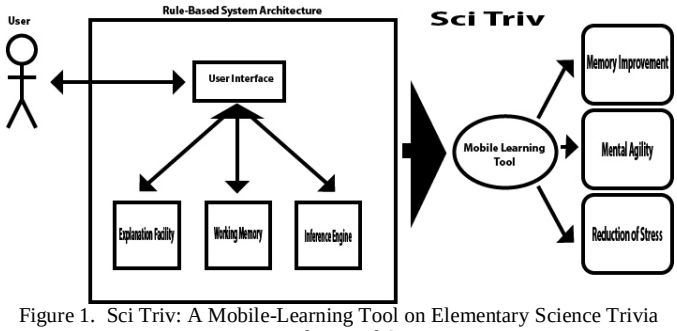

Figure 1. Sci Triv: A Mobile-Learning Tool on Elementary Science Trivia using Rule-Based System

This system has exciting and challenging concept of game. Not only user will enjoy but also they will learn new things or recall science terms that they didn't fully known before. Science is an entrancing subject with numerous amazing things to learn and find. Science plus Trivia is very exciting. Trivia can make people smarter. Every level has done, the more challenging game concept this system can be. As Robin 2010[7] concept of Rule-Based System Architecture the proposed study follows the architecture.

- User Interface – this interface will be the communication between user and the system. The user interface will be tap to play method.
- Explanation Facility – this will be the guide for the whole system. The user must follow the instruction for them to enjoy the flow of the system.
- Working Memory – all the answered question will be the key for next level. The database will store the answered question to process the unlocked next level.
- Inference Engine – this engine will prioritize the rule of the system.

As the concept of the study, it will be the tool for learning at the same time it can improves their memory, enhance the ability of memory, and to reduce stress.

VI. METHODOLOGY

In this research, researchers used Rule based system. [8]In software development, rule-based systems can be used to create software that will provide an answer to a problem in place of a human expert. These type of system may also be called an expert system. Rule-based systems are also used in AI (artificial intelligence) programming and systems. [9]Knowledge is stored as rules in the rule-base. (Also known as the knowledge base. Rules are of the form (IF some condition THEN some action) the condition tests working memory, e.g. for the presence of certain symbols or patterns of

symbols. In many systems, the conditions are expressed logically as conjunctions (occasionally, disjunctions) of predicates. In some systems, some conditions correspond to sensor data. . Rule based reasoning technique state how a system solves a problem by using knowledge of the application domain that is represented in form of rules. There are two ways of rule based reasoning methods: forward chaining and backward chaining. And for this research we use the forward chaining in this procedure, it gets an issue portrayal from the working memory as an arrangement of conditions and tries to infer determinations as an answer. When it gets the conditions, it looks all standards whose condition matches with part or the conditions' majority in the working memory. The seeking result in the system gives an arrangement of principles that are material to give a decision about the issue. Guideline based thinking system uses struggle determination methodology to choose one standard at once from the set. The chose standard is then connected to infer a decision about the issue. Substance of the working memory is overhauled in view of the determined conclusion. Looking relevant standards precede in light of the overhauled working memory substance and the thinking procedure proceeds taking into account the new coordinated guidelines. This procedure proceeds until the coveted arrangement is acquired or there is no lead whose condition matches with current depiction of the issue in the working memory. Rule Base systems are more pertinent for complete, tight, restricted and surely knew application area because of its trouble of procuring information. An issue is explained from the scratch in standard based frameworks; the thinking procedure for an issue is performed again however the issue had been comprehended before by taking after the same thinking procedure.

VII. Scope and Limitation

The proposed study will absolutely generate in mobile phones operated by Android. The system is not multi-player game but another concept of this game is for every family gathering together. No Wifi needed for this application to enjoy the game as long as user wants.

VIII. Significance of the Study

This study will be helpful to the students for them to improve their memory, increased mental agility and reduce their stress in learning in their school especially in other theory similar to the benefit of useful in trivia. From grade 3 to grade 8 students can apply this research to who's taking science subject. By compassionate the needs of the students and prosperity of aspect education, these students and educators easier to acquire knowledge to think clearer, and the more you're able to gain, it turn allowing you to understand clearly. Also, this research will give proposals on how to assess the act of the students in analyzing trivia using mobile phone.

Furthermore, this study will be accessible to the school in practicing and educating of the students in the field of science subject. And particularly, this research will develop students in thinking and recall their memory, creating new relations between other pieces of knowledge and between parts of your brain, which may help you remember things more expeditiously and keep that holding it for longer periods of time.

IX. Results and Discussion

Table 1: Survey's Response

Questions:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Using mobile phone is better for grade 3-grade 8 students?	5	5	0	0	0
It is helpful if we have a mobile app for science trivia?	6	4	0	0	0
Does science trivia helps students in learning for K-12?	4	6	0	0	0
Does students inspire to progress an understanding of science ethic and facts?	4	6	0	0	0
Does mobile phone helps students to use it for school purposes? Especially in their classroom?	5	5	0	0	0
Does teachers can use mobile phone for the quizzes, seatwork, homework, and exam for the students?	0	1	3	6	0
It is applicable for everyone to use mobile phone during class?	1	0	0	5	4
Does students challenge themselves for analyzing, recalling, and to learn more about science trivia?	6	4	0	0	0

This table shows how students and parents that we gathered response to the use of mobile learning for the students tool. There are many agreed to the use of mobile learning and how trivia can help their problem in analyzing their science subject.

X. Conclusion and Recommendation

Overall, the results from the survey performed by researchers to Elementary students and teachers of New Era University varies each category. Participants both agreed that

using mobile phone for different purposes such as for learning science trivia, understanding science ethics and facts is thus efficient for grade 3-grade 8 students. Teachers and Students who are part of survey are neutral in terms of using mobile phone inside the classroom while studying or having an exam. It can be distraction for student's learning. Thus, the use of Technology specifically mobile app for science trivia in learning and studying of elementary students will be very effective. Parents should guide them in a way that students will be greatly benefits the mobile app.

There will a lot of techniques can use by students in this generation. Sci Triv can help beneficiary them more intelligent in their science course. By using this system, beneficiary can save time for their families and make fun at the same time they will get science facts. This study will be beneficial to the elementary students in improvement of memory and mental agility when they utilize effective learning in their mobile phones setting especially in distinctive ideas related to the use of effective science mobile learning tool. Therefore, students that apply the suggested technique got from the outcome of the study will have the capacity to prepare grade school students better. The study will be able to help elementary students to become more intelligent not only in the school activities but for them to avoid brain disease. By understanding the need of the students and benefits of mobile learning tool, these elementary students will be guaranteed of advantages.

- to improve beneficiary's memory
- to increased their mental agility
- to reduce stress
- to keep their brain young

Moreover, this study will be a perfect way for grade school student to get their family and friends for a fun and challenging as they learn random facts in science and answering challenging questions.

REFERENCES

[1] http://www.oxfordlearning.com/2014/10/09/why-is-my-child-getting-bad-grades-and-what-can-i-do-about-it/ (2014)

[2] Department of Education (2015) -http://www.deped.gov.ph/

[3] McGill University (2015) - https://www.mcgill.ca/tls/projects/mobile-learning

[4] Elizabeth Buckner, Paul Kim (2013)- Integrating technology and pedagogy for inquiry-based learning: The Stanford Mobile Inquiry-based Learning Environment (SMILE)

[5] http://edtechreview.in/trends-insights/trends/658-impact-of-technology-in-elementary-classrooms

[6] Evrim Baran (2014)- A Review of Research on Mobile Learning in Teacher Education. Educational Technology & Society

[7] Jill Attewell- From Research and Development to Mobile Learning: Tools for Education and Training Providers and their Learning

[8] Robin - 2010 http://intelligence.worldofcomputing.net/expert-systems-articles/rule-based-expert-systems.html#.VgUg-cuqqko

[9] Jocelyn Ireson-Paine, 1996- http://www.j-paine.org/students/lectures/lect3/node5.html

[10] Azeb Bekele Eshete(July 2009) - Integrated Case Based and Rule Based Reasoning for Decision Support