 ISBN: 978-623-92207-1-6

Integrated Web-Based Learning Approach and The Students' Academic Achievement

1st Meliza P. Alo
Professor, Education Department
Davao Del Sur State College
Matti, Digos City, Davao Del Sur, Philippines
meliza_alo@dssc.edu.ph

2nd Domingo V. Origines JR.
Faculty, Computing Department
Davao Del Sur State College
Matti, Digos City, Davao Del Sur, Philippines
dorigines123@gmail.com

Abstract—The main objective of this study was to determine the effectiveness of integrated web-based learning approach in enhancing the academic performance in Science of Grade 7 students. The researcher used the quasi-experimental research design in to attain the objectives. Specifically, this study used the pretest-posttest non-equivalent control design in assigning groups and in applying the treatments. The study was conducted from January, 2019 to March 2019 comprising the fourth grading period. A 40-item researcher-made test questionnaire was used to determine the performance of Grade 7 students in both the control and experimental groups before and after the treatment. Data were gathered, collated and analyzed using mean, standard deviation and t-test for independent sample at 5% level of significance. The pretests mean score in the control group was 75.00 and the experimental group was 76.20, both at the developing level. The posttest mean score rating in the control group was 78.20 and remained at the developing level, while the experimental group was 85.10, increased to approaching proficient level. The mean gain rating of the Grade 7 science students in experimental group was 13.97 higher compared to the mean rating of control group that is 9.23 not exposed to integrated web-based learning approach. No significant difference on the pretest mean score ratings between Grade 7 students who were exposed and not exposed to the integrated web-based learning approach while a significant difference on the posttest mean score were noted. Furthermore, there was a significant difference on the mean gain score ratings of Grade 7 students in Science utilizing the traditional method and integrated web-based learning approach. Integrated web-based learning approach was found effective in improving the academic achievement of Grade 7 students in Science.

Keywords—*Students' Academic Achievement, integrated web-based, web-based learning, academic performance*

I. INTRODUCTION

Improving quality of education is really one of the challenges faced by countries in Southeast Asian Nations. The need for a scientifically literate populace is increasingly recognized as critical in many countries, as they faced the consequences in increasing population pressures, limited resources and environmental degradation[14]. Inside the classroom, technology is used sporadically and the over-all impact on learning appears to be significant [6], [9], [15],.

Science has been found to be the subject of lowest competence for both elementary and high school students. There was general deterioration seen in the results from School Years 2004 to 2015. However, in 2015 an improvement was seen, but with the number of students found to have low mastery on each subject consistently decreasing [7]. On the other hand, some studies were conducted and had recommended the use of multimedia and web-base curricula to enhance the learning efficacy of students. According to [5], the use of information technology in current era is considered as a solution of educational institutions to improve and quality instructions. Technology has embraced the innovative learning methodologies. New interactive media are now in use for delivering educational information. It is likewise recommended in the paper of [8], in their research on student perceptions of web-based technologies, principles of good practice, and multiple intelligences [21]. Recommendations for a robust implementation of good practices on intrapersonal, interpersonal, visual, and verbal intelligences were formulated and found that it receives higher ratings than logical, musical, bodily, and naturalist intelligences that result in greater student satisfaction. In this manner, the use of aid such as web-based instruction is a good avenue to uplift performance and be tested for this validity.

Presently, many educators in the Philippines still engage and are comfortable in using traditional method because they aren't comfortable using the internet[32]. In some schools, computer laboratories are not available. There are limited units only. Since the popularity of Web-Based Instruction is growing, there is a need to understand whether this strategy is effective or if it is better than any other teaching media [23], and [4].

Web Based Instruction (WBI) is becoming more important in the field of education as the education paradigm is changing, shifting the classroom initiatives from teachers to students [13]. The paradigm shift requires new instruction methods which can effectively adopt the rapid change of the education environment. Since the popularity of WBI is growing, there is a need to understand whether this strategy is effective or if it is better than any other teaching media [16]. Along these premises, this study was conducted to measure its effectiveness in improving the academic performance of the Grade 7 students in Science. Students enrolled in Grade 7 usually have varying levels of knowledge and understanding of science concepts due to the different learning environments. Hence, they come to class with different background. In addition, the new teaching strategy introduced in this study will promote an interactive learning environment, thus motivating and enhancing the learning skills of students in the classroom. In the conduct of this study, the topics

 ISBN: 978-623-92207-1-6

covered were on Earth and Space which was divided in to six sub-topics. In the first week of the study, the focus was on the Earthquakes, in the second week on Volcanic Eruption, in the third week on Weather Patterns, in the fourth week on Different Seasons in the Philippines, in the fifth week on Motions of the Earth and on the Solar System for the sixth week.

The main thought of the study was to determine the effectiveness of web-based instruction on the performance of Grade 7 students in science. Specifically, it aimed to:

1. Compare the pretest scores of control and experimental groups;
2. Compare the posttest scores of control and experimental groups;
3. Determine the mean gain score between the control and experimental groups;
4. Find out if there is significant difference on the pretest mean score between the control and experimental groups;
5. Find out of there is significant difference on the posttest mean score between the control and experimental groups; and
6. Find out if there is significant difference on the mean gain score between the control and experimental groups.
7. Determine the effectiveness of web-based instruction in Science of Grade 7 students.

II. METHOD

Locale of the Study

The study was conducted in Matti National High School, in Digos City Division, Davao Del Sur. The school is a partner and a recipient of the Davao del Sur State College Teacher Education Program Extension Services, specifically the Tutorial Program. The school belonged to Barangay Matti, Digos City in the province of Davao del Sur. Two comparable Grade 7 classes randomly selected were utilized as control and experimental groups. In average, there were 56 students in the control group and 58 students in the experimental group. This quasi-experimental research used a pre-test and post-test control group design where the control group and the experimental groups were chosen randomly through draw lots. To ascertain that the two groups were equal in terms of their prior knowledge of the topics that were to be covered in this study, on the first meeting of the class, a pre-test was given to the groups in succession.

The pre-test was given on the first meeting of the class during the first day of the fourth grading period. The tests composed of questions which were related to the topics or concepts covered in the study. The teaching methods used in the two groups (control and experimental) were considered the independent variables. For the experimental group, the teaching method was a web-based instruction integrated to the regular method while for the second group, regular method was applied. The researcher used a validated instrument. A self-made test based on the K 12 modules and items from the web-based. The instrument has 40 items multiple choice with different levels and with higher order thinking skills such as critical thinking and problem solving. It was validated by the science coordinators and master teachers. It was conducted to a group of Grade 7 students for validation. Result undergone item analysis to determine the test's difficulty index and discrimination index. Before the conduct of the study, the teacher sought the help of some computer experts on the technical preparations of tools for collecting data and how to run the program of the web-based instruction. Students – respondents who were involved in the study were not informed that they were chosen as subject of this research to prevent their performances or outlook in the subject from being biased by this fact.

The pre-test was administered at the first meeting of the class in the last grading period.

A. *Implementation of the Integrated Web-Based Instruction*

In the preparation for the experimental study, two rolled papers were drawn to determine which group belong to the experimental and control group between the two sections handled by the researcher. A pre-test was conducted prior to the start of the experiment to determine if the groups are comparable. Below were the procedures in the experimental and Control Groups:

TABLE 1. IMPLEMENTATION OF THE INTEGRATED WEB BASED INSTRUCTION

Experimental Group	Control Group
(5 minutes) The procedure started by the teacher conducting the preliminary activities and presenting the objectives of the lesson. Utilizing the Web-Based Instruction. (The Computer sets connected to internet shall have been prepared by the teacher before the conduct of classes) The experiment comprised the following procedures: (15 minutes) • Whole Group: The teacher introduced and demonstrated the lesson. Made available graphic organizers that students used to take notes. (15 minutes) • Small Group The students will work on the tasks stipulated in the task sheets in the website and send group output to the teacher's server. • Independent Each pupil will work on tiered activities. (5 minutes) • Whole Group Review problems or steps that students are having difficulty with and answer any question. (15 minutes) For Assessment (5 minutes) For Assignment	5 minutes) The procedure will be started by the teacher conducting the preliminary activities and presenting the objectives of the lesson. Utilizing the Traditional Approach. This will comprise the following procedure: (35 minutes) for lectures (15 minutes) for assessment (5 minutes) for assignment

1) *Data Gathering Procedures*

Before the conduct of the study, the researcher will seek the help of some computer experts on the technical preparations of tools for collecting data and how to run the

 ISBN: 978-623-92207-1-6

program of the web-based instruction. students – respondents who will be involved in the study will not informed that they were chosen as subject of the research.

The pre-test was administered on the first day of class in the last grading period. The teacher conducted the classes with highly structured curriculum. The regular way of teaching, students performed the activities in order to discover and form new concepts based on the activity. While the activity was on going, students made some predictions about the results and shared or discussed with their classmates. The teacher entertained questions from the students about the activity. Sample problems and exercises were given after the activity, then students was given quiz and enrichment activities. The remaining 120 minutes of the class was used in the web-based instruction. The teacher used the web-based instructions to reinforce what was already taken up in class using the regular method of teaching.

In the integration of the Web-based instruction to the regular teaching method was used in the experimental group. The experimental group used the science laboratory room with internet connection and other instruments needed in the study such as LCD projector and desktop computer. Fifty percent of the program used Web-based instructions and another fifty percent was used for regular instruction such as practical work approach (PWA). The science subject in the grade 7 is allotted 240 minutes per week. The 120 minutes was spent using the regular teaching method. The other 120 minutes per week was spent on the web-based science instruction.

In the web-based instruction program, educational videos will be used in capturing the interest of the students; it also used as enrichment activities. In some lessons, helpful graphics was embedded to reinforce the text written in the page. This was followed by the browsing of the multimedia section. The multimedia section contained more graphics and clips that are informative. Then the students answered quiz found in the quiz section of the program.

The integration of web-based science program in combination with the teaching method was used to compliment the topics to be discussed in class. The Science Activities and Videos from KHAN Academy were among the internet materials used by the researchers in accessing tutorials with exercises, questions, online drill and practice. Students from this group was assessed by giving periodic tests. The post-test was conducted after the six topics in Earth and Space was completed in six weeks in the fourth grading period, from January 2019 to March 2019. The results was analyzed using the independent-sample t-test and paired-sample t-test. The independent-sample t-test was used to determine the significant difference between the gain scores of the experimental group and the control group.

III. RESULT

A. *Pretest Mean Score in Science of Grade 7 Students Experimental and Control Groups*

This study utilized a researcher-made test composed of 40 items which was administered prior to the start of the experiment. The instrument utilized in the pretest was also used in the posttest to investigate the effectiveness of the web-based instruction on the academic performance Grade 7 students in Science.

The researcher used the following scales in measuring the students' academic performance which are measured in terms of mean grading scale based on DepEd Order no. 31 S.2012 on the Department of Education: 90 and above (PS of 84.00 to 100.00) – Advanced; 85 to 89 (PS of 76.00 to 83.99) – Proficient; 80 to 84 (PS of 68.00 to 75.99) – Approaching Proficient; 75 to 79 (PS 60.00 to 67.99) – Developing; and 74 and below (PS of 0.00 to 59.99) – Beginning.

Table 2 highlights the pretest performance rating of grade 7 student in the web-based instruction and traditional learning groups. The pretests mean score in the control group was 75.00, with a standard deviation of 2.02; while in the experimental group was 74.40 with a standard deviation of 2.15. The baseline data on the pretest performance of both groups was described as developing. This means that the students at this level possess the minimum knowledge and skills and core understanding but needs help throughout the performance of the authentic tasks.

TABLE 2. PRETEST MEAN SCORE RATING IN SCIENCE OF GRADE 7 STUDENTS IN EXPERIMENTAL AND CONTROL GROUP. S.Y 2018-2019**.**

Group	Mean	Standard Deviation	Performance Level
Control (Traditional)	75.00	2.02	Developing
Experimental (Integrated Web-Based Instruction)	74.40	2.15	Developing

The result of the pretest mean score was important s this shows that the groups are comparable. This implies that both groups have the same level of knowledge prior to the conduct of the study.

B. *Posttest Mean Score in Science of Grade 7 Students Experimental and Control Groups*

Table 3 specifies the posttest performance rating of the Grade 7 students under control and experimental groups. The posttest mean score rating in the control group is 79.00 with a standard deviation of 3.27. Data implied that the posttest performance of students in the control group remained at the developing level. This implies that the students at this level possess the minimum knowledge and skills and core understanding but needs help throughout the performance of the authentic tasks.

TABLE 3. POSTTEST MEAN SCORE RATING IN SCIENCE OF GRADE 7 STUDENTS IN EXPERIMENTAL AND CONTROL GROUP. S.Y 2018-2019.

Group	Mean	Standard Deviation	Performance Level
Control (Traditional)	79.00	3.27	Developing
Experimental (Integrated Web-Based Instruction)	84.60	1.79	Approaching Proficient

In the web-based instruction, the posttest rating was 84.60 with a standard deviation of 1.79. Based on the numerical data, the posttest performance of the experimental group improved from developing level to approaching

 ISBN: 978-623-92207-1-6

proficient level. This means the students in this level developed fundamental knowledge, skills and with guidance from the teacher or with the peers, and can transfer them these understanding through authentic tasks.

Furthermore, the result in both groups revealed that there was a noticeable increase in the mean scores, at a varying level, in the posttest as compared to the pretest. The significant increases in the mean scores of Grade 7 students in both groups implied that they have benefited and achieved learning in the two instructional approaches.

This was supported by the perspective of [10] and [26], elucidated that while traditional learning is still effective, e-learning application is more effective and brought digital literacy into helm. This involved technical applications geared towards addressing learning gaps through a wide array of software which were readily available on-line. The students eagerly participated with peers as they were guided by their teacher in a variety of learning activities through web-based instruction.

In addition, [15], [21] and [23], documented the advent of web-based instruction in the classrooms. They observed students showed earnest desire in using electronic media, as they browsed online resources; interpreted visual images; connect Science ideas; and engaged in content analysis by visually representing images using web-based instruction. These numerous digital applications motivated the students to participate fully in the learning activities.

C. *Mean Gain Rating in Science of Grade 7 students Experimental and Control Groups*

Table 4 specifies the mean gain rating of the Grade 7 students in science in control and experimental groups. In the control group under traditional method of teaching, the mean gain rating is 9.23 with a standard deviation of 3.86, while the experimental group under web-based instruction, the mean gain rating is 13.97 with a standard deviation of 2.49. Based on numerical data, the mean gain rating of Grade 7 students under the experimental group exposed to web-based instruction improved and is noticeably higher compared to the control group not exposed to web-based instruction.

The significant increase in the mean gain of Grade 7 students in the experimental group implied that they were able to achieve learning in the integrated web-based instruction. This perspective is supported by [14] Miller (2010) when he theorized that integrated web-based instruction adds excitement to the lesson and holds the students attention and arouse students' interest as they indulge in critical thinking activities. The instructional design encourages curiosity and allows students to interact with dynamism and keenness.

TABLE 4. MEAN GAIN RATING IN SCIENCE OF GRADE 7 STUDENTS IN EXPERIMENTAL AND CONTROL GROUP. S.Y 2018-2019.

Group	Mean	Standard Deviation
Control (Traditional)	9.23	3.86
Experimental (Integrated Web-Based Instruction)	13.97	2.49

D. *Difference in the Pretest Performance in Science of Grade 7 Students Experimental and Control Groups*

Table 5 shows the comparison of pretest mean score rating of Grade 7 students under the control and experimental groups.

TABLE 5. SIGNIFICANT DIFFERENCE OF THE PRETEST PERFORMANCE IN SCIENCE OF GRADE 7 STUDENTS EXPERIMENTAL AND CONTROL GROUP. S.Y 2018-2019.

Group	Mean	Standard Deviation	t-value	p-value	Decision
Control (Traditional)	75.00	2.02			
Experimental (Integrated Web-Based Instruction)	74.40	2.15	-1.370	.175	Failed to Reject Ho.

The result was analyzed using t-test for independent samples with equal variances not assumed. Based on the result, the t-value (-1.370) of the pretest mean score of students in experimental and control groups obtained a p-value of .175, which is greater than the .05 level of significance. This result indicated that there was no sufficient evidence to reject the null hypothesis. This means that there was no significant difference between the pretest mean score ratings of Grade 7 students in Science exposed and not exposed to integrated web-based instruction. This further implies that both experimental and control groups have comparable academic performance in the intended learning competencies before the conduct of experiment.

E. *Difference in the Posttest Performance in Science of Grade 7 students Experimental and Control Groups*

Table 6 shows the posttest mean score rating of Grade 7 students under the control and experimental groups.

TABLE 6. SIGNIFICANT DIFFERENCE OF THE POSTTEST PERFORMANCE IN SCIENCE OF GRADE 7 STUDENTS EXPERIMENTAL AND CONTROL GROUP. S.Y 2018-2019.

Group	Mean	Standard Deviation	t-value	p-value	Decision
Control (Traditional)	79.00	3.27			
Experimental (Integrated Web-Based Instruction)	84.60	1.79	(-9.008)	.000	Reject Ho.

Differences in means were further tested using t-test for independent samples with equal variances not assumed. Based on the result, the t-value (-9.008) of the posttest mean score of students in experimental and control groups obtained a p-value of .000, which is smaller than the .05 level of significance. Thus, the null hypothesis was rejected. Hence there was a significant difference between the posttest mean score ratings of Grade 7 students in Science exposed and not exposed to integrated web-based instruction.

 ISBN: 978-623-92207-1-6

F. *Difference in the Mean Gain Rating in Science of Grade 7 students Experimental and Control Groups*

Table 7 showed the mean gain score rating of Grade 7 students in science in the traditional and web-based instruction groups. Based on the result, the mean gain score of the students in the traditional learning group is 9.23 with standard deviation of 3.86 while the web-based instruction was 13.97 with a standard deviation of 2.49. Both groups showed varied levels of increase in their test performances. Differences in the mean gain score rating were noted and further tested using t-test for independent samples, equal variances was not assumed. Based on the result, a larger t-value (14.925) was higher than the t-tab (2.032) and supported by the p-value (0.000) which was smaller than 0.05 level of significance, thus, null hypothesis was rejected. This denotes that there was strong sufficient evidence rejecting the null hypothesis. Thus, there was a significant difference on the mean gain score rating of Grade 7 students in Science in the traditional and the integrated web-based instruction groups.

TABLE 7. SIGNIFICANT MEAN GAIN RATING IN SCIENCE OF GRADE 7 STUDENTS EXPERIMENTAL AND CONTROL GROUPS S.Y 2018-2019.

Group	Mean	Standard Deviation	t-value	p-value	Decision
Control (Traditional)	9.23	3.86			
Experimental (Integrated Web-Based Instruction)	13.97	2.49	(14.925)	.000	Reject Ho

The numerical data implied that there was a significant difference on the mean gain score rating of Grade 7 students in Science in the traditional and the integrated web-based instruction groups. The result confirmed that web-based instruction was effective in improving the academic performance of the Grade 7 students in Science as compared to those in traditional learning group.

This finding is similar to the result of the study conducted by [12] indicating significant increases in student performance observed when web-based instruction was used in Science. Gains of 21 to 57% and effect sizes in the large range which suggest that increases observed were meaningful, not just statistically significant. These increases were consistent to the study of [7]on the Effectiveness of web-based instruction found a statistically significant difference in performance scores in web-based vs. teacher directed instruction. The students under web-based instruction reached better scores than students under teacher-directed instruction, leading the author to conclude that web-based instruction can be an effective method of teaching. In addition, result revealed that teachers believed that the use of web-based instruction increased student learning and engagement.

G. *Test of Effectiveness of Web-Based Instruction in Mathematics of Grade 7 Students*

TABLE 8. TEST OF EFFECTIVENESS OF WEB-BASED INSTRUCTION IN SCIENCE OF GRADE 7 STUDENTS.

Group	Mean	Standard Deviation	Effectiveness	Description
Control (Traditional)	9.23	3.86		
Experimental (Web-Based Instruction)	13.97	2.49	56.96.	Effective

Table 8 shows the test of effectiveness of web-based instruction in Science of Grade 7 students under experimental group. Result shows that the experimental group exposed to web-based instruction has a mean of 13.97 with a standard deviation of 2.49, while the control group exposed to traditional instruction has a mean of 9.23 with a standard deviation of 3.86 Over-all, based on numerical data presented, the web-based instruction in the experimental group gained an effectiveness value 56.96 described as “effective”. This implies that the utilization of web-based instruction in the experimental group in Science of Grade 7 students is effective. This indicates that web-based education has positive effects on the improvement of academic achievement. The Effect of web-based education suggests that this has positive effects mainly on motivation for learning and interest in the lesson, as the students were actively engaged in learning tasks.

The findings were similar to the results in the study of [12], and [20] on the Students' perception on use of web-based learning in the classroom, examines the application of web-based instruction on the students’ academic performance. The results show that web-based instruction is effective in enhancing students academic performance as this provides the opportunity to use computers and world wide web in teaching provides hands on activities, supports cooperative learning, provides active/constructive learning experiences and produces greater peer interaction among students.

The result is similar to the of the study [15] on the Students' perception on use of web-based learning in the classroom which the results show that web-based instruction was effective and improved the student academic performance. In the Philippines, the study conducted by [13] indicating that among 376 secondary students in English, revealed that the students exposed to web-based instruction are gaining higher than those of the conventional instruction. In addition, [28] indicating that web-based instruction was effective and had improved students academic performance. Result further revealed that students’ interest in web-based learning is high. The authors argue that the students’ hands-on and self-learning using web-based learning increased their interest, hence, improves academic performance.

With the number of researches conducted on the effectiveness of web-based instruction. It is generally

accepted that information technology increases materialistic and moral value, and is widely used in areas of education and even in the economy, health, agriculture, social life, and entertainment [27].

IV. CONCLUSION

The main objective of this study was to determine the effectiveness of web-based instruction in enhancing the academic performance of Grade 7 students in Science. The researcher used the quasi-experimental research design in to attain the objectives. Specifically, this study used the pretest-posttest non-equivalent control design in assigning groups and in applying the treatments. The study was conducted from January, 2019 to March 2019 comprising the fourth grading period. The participants of the study were two intact classes of Grade 7 students in Science. The two intact classes involved in the study for experimental and control groups. The students in the experimental group were taught in Science using web-based instruction while the control group employed traditional learning approach in teaching Science. Data were gathered, collated and analyzed using mean, standard deviation and t-test for independent sample.

The test of effectiveness of the web-based instruction in the experimental group gained an effectiveness value 56.96 described as "effective". This implies that the utilization of web-based instruction in the experimental group in Science of Grade 7 students is effective. As a result, there was a significant difference on the mean gain score rating of Grade 7 students in Science in the traditional and the experimental groups. Likewise, the Web-based instruction is an effective teaching strategy that improves academic performance of the Grade 7 students in Science.

V. RECOMMENDATIONS

In the light of the foregoing findings, the following are recommended; (1)the DepEd Senior officials may recommend the use of Web-based instruction across all learning areas, so as to improve the academic performance of students geared towards global competitiveness, (2) The school administrators may benchmark the utilization of web-based instruction in their respective schools to pave way to improved educational outcome, (3) The teachers may replicate the utilization of web-based instruction in Science where the students are provided with varied digital learning resource materials, equipped with videos, animations, and graphics which actively engage them in stimulating online activities towards improved academic performance. Lastly, (4) the future researchers may utilize the literature on web-based instruction in their respective schools.

REFERENCES

[1] E. ABAO, E. . Engagement to Social Networking: Challenges and Opportunities to Educators. European Scientific Journal.Vol.11, No.16, 173-191.(2015)

[2] K. ALE, and A. CHIB. , "Community factors in technology adoption in primary education: perspective from rural India," Information Technology and International Development, vol. 7, pp. 53-68, 2011. (2011)

[3] S. BELL (2010). Project-based learning for the 21st century: Skills for the future. The Clearing House, 83(2), 39-43. Essence of using ICT on In-service Teachers Basic ICT Literacy," Malaysian Journal of Educational Technology, vol. 10, pp. 5-10, December, 2010.

[4] H. BOHOLANO. ICT Based Instruction in a Constructivist Classroom. Int. J. Comp. Educ.Dev., Aug. 2013, Vol. 15, No. 2, 124-136. (2013)

[5] C.S. Cavanaugh. The effectiveness of interactive distance education technologies in K-12 learning: A meta-analysis. International Journal of Educational Telecommunications,7(1), 73–88. (2011)

[6] Y. ERDOGAN.Factors that Influence Academic Achievement and Attitudes in Web-Based Education. Journal of Instruction . ISSN:164-609X. 2008

[7] V.C. GORRA. "Students' Perception on Use of Technology in the Classroom in Philippines " Surigao, State College of Technology.

[8] L.B. HOLCOMB and C. M. BEAL. "Capitalizing on Web 2.0 in the Social Studies Context," Tech Trends,vol. 54, pp. 28-33, July, 2010. http://dx.doi.org/10.1007/s11528-010-0417-0 /. International Council for Science (2011).

[9] R.A. KARIM. Effectiveness of Web-Based Instruction and Students Attitude towards Learning. International Conference on Teaching and Learning education 2011. University of Teknologi MARA. Researchgate 4/19/2019. (2011)

[10] D. LAZARRO & E.M. MEDALLA. "English as the language of trade, finance and technology in APEC: An east Asia perspective." Philippines Journal of Development, Vol. 31, pp. 277-300, 2004. (2015.

[11] L. B. LISA. Thinking Like 21st Century Learner: An Exploration of Blog use in a Skilled-Based Counselor Education Course (Ed D Dissertation). California: Proquest; California Lutheran Universi-ty, 9(2011)

[12] Y.LIU. Social media tools as a learning resource. Journal of Educational Technology Development and Exchange, 3(1), 101-114.(2010)

[13] R. W. MAHAJAN, R. W. MUELLER, J. REED, T. A. CAMBELL, and N. RAMAKRISHNAN, "Cultivating Emerging and Black Swan Technol-ogies," ASME Proceedings, vol. 6, pp. 549-557, November 2012 [International Mechanical Engineering Congress and Exposition. Texas, USA (2012).

[14] R. Maier: Knowledge management systems. 3rd Edition, Springer, Berlin.No.8/9, pp. 506-516.Perth, Western Australia (2017)

[15] Ministry of Education (2019). Malaysia Education Blue Print. 2013-2025-Executive Summary [Online]. Available: http://www.moe.gov.my/userfiles/file/PPP/Preliminary-Blueprint-Eng.pdf.

[16] M. ROSNAINI And I. MOHD ARIF. "Impact of Training and Experience of using ICT on In-service Teachers Basic ICT Literacy," Malaysian Journal of Educational Technology, vol. 10, pp. 5-10, December, 2010.

[17] TAPSCOTT. Innovating the 21st-century university: It's time!. Educause review, 45(1), 16-29. (2010)

[18] R.B. TASMIN, R.B, et.al . "The impact of information and communication technology on Banks performance and cus-tomer service delivery," International Journal of Latest Trend in Finance and Economic Science, vol. 2, pp. 80-90, March 2012.

[19] D.V. Origines., & M.P. Alo. Test Item Analysis on Mock Board Licensure Examination: A Decision Support System. 2019

[20] M.T. USMAN, M.T. Level of Implementation of DepEd computerization Program in Public Elementary Schools. San Antonio Graduate Studies, Quezon City, Philippines. (2018)

[21] K.L.WOODS, K.L and G.V. MILLER. G.V . Adventures with Cell Phones-turn on your brain," Educational Leadership, vol. 68, 39-43. February, 2014.

[22] AA.J. ZAIDIEH. The Use of Social Networking in Education: Challenges and Opportunities. World of Computer Science and Information Technology Journal (WCSIT). Vol. 2, No. 1, 18-21, 2012

[23] C.M. Chiu, & H.C. Chang. Examining the integrated influence of fairness and quality on students' satisfaction and Web-based learning continuance intention. Information systems journal, 17(3), 271-287. (2007)

[24] B. Woolf, B., Day, R., Botch, & D. Hart. OWL: An integrated Web-based learning environment. In International conference on mathematics/science education and technology (pp. 106-112). Association for the Advancement of Computing in Education (AACE). (1999)