Designing Initiation Materials for Promoting Autonomous Learning in Blended Learning EFL Classroom

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DIGLOSSIC APPROACH IN TEACHING ELEMENTARY SCIENCE: AN INNOVATIVE STRATEGY

Ma. Theresa G. Palmares
Northern Iloilo Polytechnic State College Estancia, Iloilo

Abstract. This action research is about using local language as the intervention in teaching elementary science in below average learners. The use of mother tongue as ways of communication in basic science in primary schools can assist as a means of enhancing science teaching and learning process. The pre-test performances of science learners in diagnostic and traditional approaches were all below average with the mean scores of 10.71 and 11.29, respectively. However, the post-test mean scores obtained by the diagnostic group was high (28.49) compared to the traditional group which was below average (15.27). The t-test for paired samples test exposed a significant difference in the pre-test and post-test in the diagnostic approach as well as in traditional approach. Furthermore, the result suggests that both groups had more or less the same scores at the start of the intervention and were therefore comparable in terms of performance. The result indicates that although both groups gained, the diagnostic approach had a greater mean gain and therefore had a better performance compared to the traditional group. Learning science required comprehension, teaching using our local language help learners achieved the goal to increase their performance.

1. Introduction
According to [4], the role of language as a medium of instruction in promoting an effective teaching and learning is always an issue all over the world for many years. This continuously occupied many scholars over the world on how to resolve this problem. In the Philippines, English is introduced as the “global” language, as well as the language of math, science ,and technology.
In 1953, UNESCO has encouraged mother tongue instruction in primary education that highlights the advantages of mother tongue education right from the start. According to [10], children are more likely to enroll and succeed in school. Also, [2] stated that parents are more likely to communicate with teachers and participate in their children’s learning. While [6] said that girls and rural children with less exposure to a dominant language stay in school longer and repeat grades less often. And children in multilingual education tend to develop better-thinking skills compared to their monolingual peers [9].

Furthermore, the study of Bala (ND) revealed that the use of mother tongue in teaching in a multilingual setting affects the way pupils learn. Also, the use of Mother’s tongue as a means of communication in the teaching and learning of basic science in primary schools can assist as a means of enhancing science learning. In addition, it can also help in presenting and preserving the value of one’s culture.

Many science teachers today utilized bilingual methods in teaching the subject specifically in below average learners. According to [3], researches both local and international prove the positive outcomes of bilingual education programs. Based on the findings conducted in the United States bilingual programs overtake their monolingual counterparts in metalinguistic awareness, concept formation tasks and analogical reasoning ability. Furthermore, students in bilingual programs also outperform their peers in standardized achievement tests in either language [7]. Moreover, it was revealed that teacher-student interaction could not have been possible if they were obligatory to express their thoughts in English. This is because most school children come from homes in which their mother tongue is the predominant language, resulting to their early social marginalization. Also, this hindered students to learn science as a subject. It was possible for the teacher and the students to use the science process skills because they conversed in their own dialects.

This study is anchored on the use of diglossia in teaching elementary science in below average learners. Diglossia means the co-existence of two language varieties [5]. According to [13], the authorized language is called the “high” language as official capacities like writing, teaching and speaking at formal functions, while the other is the “low” language as common verbal spoken by the members of the community.

In District of Balasan science teachers taught science in vernacular especially in the lower section because the National Achievement Test (NAT) results were always below the division standard. They were encouraged to create an intervention to improve performances both local and national. Teachers utilized Hiligaynon as a medium of instruction in science because they found out that most of these learners have lack of deeper understanding on the subject matter, they couldn’t comprehend the science concepts and ideas and not able to communicate effectively because they are scared to speak.

2. Research Design

This research employed a qualitative research design to determine the effect of diagnostic approach in teaching elementary science. The respondents of this action research were two lower section of Grade 6 pupils in the District of Balsan, Iloilo, the Philippines for School Year (SY) 2017-2018.

The researcher will construct a 30-item problem-solving test which involves the four fundamental operations. The researcher will ensure that test item can be solved using the block model approach. The
problems will be patterned from standardized textbooks. The instrument will be validated by the group of experts in Science.

The instrument in this study was taken from Unit VI – “The Changing Earth” from the lesson I and II, “The Earth’s Surface” and “The Moving Crust of the Earth” respectively. The test questions were 30 item that pattern from the previous National Achievement Test. The teacher modified the question based on the level of the students. This was validated by 5 experts coming from the district who are teaching science and college professor.

The score was classified as high (30 – 24), average (23 – 17), below average (16 – 10), and low (9 – 0).

The 30-item researcher-made pre-test will be given to the respondents on a scheduled date. Test papers will then be checked and recorded. Then, five parallel test questions per day will be explained to them thoroughly. The intervention will last for four weeks. After 20 days of intervention, a 30-item researcher-made post-test parallel to the pre-test will be given. Then, test papers will be checked and recorded. The data gathered will be subjected to the appropriate statistical tool, specifically the T-test using SPSS software. The results will then be interpreted.

3. Results

Descriptive data Analyses

The mean scores revealed the levels of performance of pupils in diagnostic and traditional approach. Also, standard deviations were employed to determine the respondents’ performance in the two approaches.

**Pre-test scores in Diagnostic Approach and Traditional Approach.** In general, the performances of science learners in diagnostic and traditional approaches were all below average. The mean score for traditional and diagnostic approaches were 10.71 and 11.29, respectively.

Below average test scores in this study are approximately between 10 – 16. This below average results might have been due to the fact that the lesson is new to the pupils and it’s their first to encounter the topics before they were given the pre-test. Some of them were tired, hungry and not interested to take the exam.

| Group                  | N  | SD   | Mean  | Description        |
|------------------------|----|------|-------|--------------------|
| Traditional Approach   | 51 | 2.928| 10.71 | Below Average      |
| Diagnostic Approach    | 51 | 3.354| 11.29 | Below Average      |

**Post-test scores in Diagnostic Approach and Traditional Approach.** Post-test scores showed that the mean score obtained by the Diagnostic approach was high and that of the traditional approach was below average. The means were 15.27 for traditional approach and 28.49 for diagnostic approach. Compared to the results of the pre-test, both approaches had increased mean scores in the post-test.; however, the diagnostic approach had a better result which was “HIGH”. The standard deviation of the diagnostic approach and the traditional approach revealed a wider dispersion from the mean in the post-test as compared to the pre-test.
The high score is in between 24 – 30. The high performance of the diagnostic approach could be attributed to the pupils’ interest in the strategy employed. Also, the approach help’s the students understand the lesson very well because they were to comprehend the topics properly. In addition, since the pupils were allowed to speak in their dialect, they are to ask questions that they don’t understand during the discussion; thus, the teachers can explain the difficult ideas and concepts correctly.

Also, during the lesson proper, all the pupils in the diagnostic group were very attentive and very interactive because they can express their selves freely. Even during the activities, they all participated and give good opinions on how to do procedures correctly.

### Table 2

| Group                 | N    | SD   | Mean | Description   |
|-----------------------|------|------|------|---------------|
| Traditional Approach  | 51   | 3.527| 15.27| Below Average |
| Diagnostic Approach   | 51   | 5.297| 28.49| High          |

#### Inferential Data Analysis

The significance of the differences in the level of the performance of science pupils towards the two approaches was determined in this study.

The t-test for independent samples set at 0.05 alpha was used to determine the significance of the difference in the performance of the participants classified as to approach. The t-test for paired samples set at 0.05 alpha was also sued to determine the significant differences in the pre-test and post-test means scores of each approach.

#### A Difference in the pre-test and post-test scores in the Diagnostic Approach.

To determine the significant difference of the pre-test and post-test scores in the diagnostic approach, the research again employed the t-test for a dependent sample set at .05 level of significance. The t-test for paired samples test exposed a significant difference in the pre-test and post-test in the diagnostic approach, \( t(50) = -28.849, p = 0.000 \).

The result implies that the diagnostic approach mean score in the post-test was very significant high compared to pre-test score. Even though the approach was new to the pupils but they were to cope very well because most of their science teachers in the past were using purely English in teaching Science. Some of them used vernacular in teaching the subject area, thus; the new approach is very effective and applicable especially to below average learners.

#### A Difference in the pre-test and post-test scores in the Traditional Approach.

To ascertain whether a significant difference occurs in the pre-test and post-test results, the researcher utilized the t-test for paired samples set at .05 level of significance.

The test for paired samples test showed a significant difference in the pre-test and post-test performances of the pupils exposed to the traditional approach, \( t(50) = -12.358, p = 0.000 \).

This implies that the traditional group’s mean score in the post-test was significantly improved than that of the pre-test. Although the traditional approach was the common methods in teaching science, the pupils were able to adapt to and apply the strategy to their learning. Therefore, the results show that the traditional method was also effective and applicable to pupils but scores showed not expressively higher.
A Difference in the pre-test scores between Diagnostic Approach and Traditional Approach. The results revealed no significant difference in the pre-test performance of pupils of the two approaches, \( t(100) = 0.944, p = 0.348 \). The result suggests that both groups had more or less the same scores at the start of the intervention and were therefore comparable in terms of performance.

A Difference in the post-test scores in Traditional Approach and Diagnostic Approach. The results revealed a significant difference in the post-test score of the pupils taught using diagnostic approach performed better than those taught using the traditional approach, \( t(87.062) = -14.831, p = 0.000 \). The result indicates that although both groups gained, the diagnostic approach had a greater mean gain and therefore had a better performance compared to the traditional group. Learning science required comprehension, teaching using our local language help learners achieved the goal to increase their performance.

4. Conclusion

The findings of the study showed that the diagnostic approach is a good strategy in teaching science in below average learners. This intervention was effective because the pupils were able to understand Science concepts and ideas appropriately. They were able to comprehend difficult terms because the teachers explain the lesson in their commonly spoken language. They were not afraid to ask questions if they encountered new terms.

This will help our learners increase their performances as well as results in various local, national and international achievement tests. Using our local language to teach Science will make teachers become innovative. This stop pupils notion about Science as a difficult subject but instead Science is fun and interesting. Thus, our learners will be encouraged to value the importance of Science in today’s generation.

5. Recommendation

In teaching elementary science, this study recommends adopting the mother tongue as the language of learning and instruction because science process skills and elementary school children are at a stage in which they are still mastering their mother tongue. Furthermore, DepEd should train teachers on how to use local language and English as a medium of instruction in teaching Science. Not all term in science can be translated into our own language. Thus, it is important not to confuse learners on this matter. Integrating our dialect into learning and teaching can also be effective in other subject areas like Mathematics or even in English. This will help our learners comprehend our subject matter accurately.

References

[1] Bala, S. (ND). The Use of Mother Tongue as a Means of Communication in the Enhancement of Science Learning in Primary Schools: The Nigeria Situation. Department of Integrated Science, Federal College of Education, kano State Nigeria. Retrieved November 12, 2015 from http://stemstates.org/assets/files/262_saudat%20shehu%20full%20paper.pdf
[2] Benson, C. (2002). Real and potential benefits of bilingual programmes in developing countries. *International Journal of Bilingual Education and Bilingualism, 5* (6), 303-317.
[3] Cloud, N. Genesee., F. and Hamayan, E. (2000). Dual Language Instruction A 29 Handbook for Enriched Education. Boston, MA, Heinle and Heinle Thomson Learning.

[4] Deyi, S.; Simon, E.; Ngcobo, S.; & Thole, A. (2007). Promoting the multilingual classroom: Why the significance of multilingualism in HE?. Paper presented at the National Foundation Conference, Conversations about Foundation, Granger Bay, 2-3 October 2007.

[5] Ferguson, C. A. (1959). Diglossia. Word, 15, 325-340.

[6] Hovens, M. (2002). Bilingual education in West Africa: Does it work? International Journal of Bilingual Education and Bilingualism, 5 (5), 249-266.

[7] Howard, E. R., Sugarman, J., Christian, D., Lindholm-Leary, K. and Rogers, D. (2005). Guiding Principles for Dual Language Education. Washington, DC, Center for Applied Linguistics.

[8] Kelly M. (2015). Pretests: Importance and Uses of Pretests. About.com. Retrieved November 10, 2015 from http://712educators.about.com/od/assessments/a/pretests.htm

[9] King, K., & Mackey, A. (2007). The bilingual edge: Why, when, and how to teach your child a second language. New York: Collins.

[10] Kosonen, K. (2005). Education in local languages: Policy and practice in Southeast Asia. First languages first: Community-based literacy programmes for minority language contexts in Asia. Bangkok: UNESCO Bangkok.

[11] Merriam-Webster. (2015). Posttest. An Encyclopedia Britannica Company. Retrieved November 5, 2015 from http://www.merriam-webster.com/dictionary/posttest.

[12] Sagor, R. (2015). What is Action Research? Retrieved November 5, 2015 from http://www.ascd.org/publications/books/100047/chapters/What-Is-Action-Research%2C-A2.aspx

[13] WiseGeek. (2015). What is Diglossia? Retrieved Nov 2, 2015 from http://www.wisegeek.com/what-is-diglossia.html