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"Finding Probability" (E-SIM): A Tool to Develop Mastery in Solving Mendelian Genetics & Basic MS Application

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Abstract This study explored the use of Electronic Strategic Intervention Material (E-SIM) in Science 8 for the fourth quarter of the school year 2019-2020. The application of the material is important towards achieving the needed competencies of the students which they failed to achieve in a typical classroom instruction. 20 of 68 Science 8th Grade students were identified least mastered in the competency of Mendelian Genetics Dihybrid Cross during formative assessment. Furthermore, these students experienced difficulties in Solving Mendelian Dihybrid Cross using Punnett squares, and interpretation of genotypic and phenotypic ratios are also considered hurdles in learning and understanding basic genetics. With theme "No learners will be left behind" these 20 students were subjected as respondents. A pre-test and post-test were conducted to measure the respondents' scores. During the pre-test the overall percentage of the respondents valued at 28.75% classified as "Not Mastered". After the results were generated an strategic intervention material entitled "Finding Probability" was introduced that would help develop mastery in solving Mendelian Genetics Dihybrid Cross using E-SIM and most importantly to obtain the percentage of increase of the respondents and it showed a significant increase of 75.25% classified as "nearly mastered". The percentage of increase obtained a value of 45.5%. On the other hand, the result of the study implies that the majority of the respondents manifest an increase of scores after the intervention was introduced. The positive result of the respondents suggested that the application of E-SIM was appealed and appreciated to both types of learners.

Keywords: *Intervention material, Mendelian genetics*

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1. Context and Rationale

Solving Mendelian Dihybrid Cross is one of the fundamental topics in biology. It is a probability cross that involves two traits. However, it is one of the identified least mastered competencies in fourth quarter. It has been noted by several researchers that the use of Electronic Strategic Intervention Material or (E-SIM) has a significant effects on the students' academic performance and it makes easier for the teacher to devise creative ways in conducting remedial classes than having a traditional remedial classes. Moreover, the use of strategic intervention materials goals to improve the least mastered competencies of the learners in a specific topic of subject area [1]. In the case of Grade 8 level students of Bangsud Integrated School with a population of 68 students, 20 students exhibited low scores in this topic. Students' encountered difficulties in solving Mendelian Genetics Dihybrid Cross using punnet square and Interpretation of Genotypic and Phenotypic ratio are also considered hurdles in learning and understanding genetics.

With the anchored objectives of the K-12 curriculum "No child will be left behind" it is imperative that teachers should find ways to effectively deliver what is meant for the learners. Thus, an intervention entitled "Finding Probability" is designed that would help develop mastery in Solving Mendelian Genetics Dihybrid Cross, to undo misconceptions, increase student learning of the difficult concepts and to avoid students marginalization. E-SIM promotes autonomous learning and memory enhancement among learners to better their performance in understanding many complicated concepts and skills in science [2]. Proving that students can cope with science lessons with the teacher utilization and integration of intervention materials. [3] The E-SIM also provide computerized activities that engage students in operating basic MS applications such as MS power point, MS excel, and MS word to mention.

2. Innovation, Intervention and Strategy.

The researcher initiated to create strategic intervention material entitled "Finding Probability" that would help them increase mastery in solving Mendelian Genetics

Dihybrid Cross and Interpreting Genotypic and Phenotypic Ratios. The Strategic Intervention Material was validated on the 1st week of February 2020 by the experts. This intervention were given to the identified students who shows low mastery level in the aforementioned competency.

3. Action Research Questions

1. What is the score of the Grade 8 Science students before employing the intervention?
2. What is the score of the Grade 8 Science students after employing the intervention?
3. What are the significant results in operating/using E-SIM during intervention?
4. What are the significant results in operating/using E-SIM after employing intervention?
5. What is the percentage of increase of the scores of Grade 8 Science students before and after employing "Finding Probability" E-SIM?

4. Action Research Methods

4.1. Respondents

The study focused on the identified students who exhibited low scores during formative assessment. The time frame of this study covers from January- February, Fourth Quarter of the School Year 2019-2020. The span of time is considered to gather necessary data to be able to arrive to a result or conclusion based on the findings shown.

4.2. Data Collection Method

The study utilized evaluative data collection method. A pre-test conducted in the month of February 2020 to the identified Science 8 respondents. Test activities were derived from the E-SIM using various MS application. Data were evaluated and analyzed. When results were generated an intervention program was introduced through the use of E-SIM, after which a post-test were given to the identified learners. The researcher employed the purposive sampling since 20 students needing immediate attention were chosen.

4.3. Scoring Procedure

The scoring procedure is divided into four mastery levels based on the percentage indicated; 91%-100 - Highly Mastered, 81%-90% Mastered, 71%-80% Nearly Mastered, 70%-below Not Mastered.

5. Discussion of Results and Conclusion

Table 1. Shows that all of the respondents exhibited low scores in the pre-test conducted. The score of 9 was the highest obtained by respondent numbers. 2, 7, and 10 with a percentage of 45%, while the score of 1 was the lowest obtained by the respondent no. 13 with a percentage of 5%. The results indicated that the respondents were not mastered the topic. The result shows that 13 respondents were able to commit mistakes in operating the E-SIM.

Table 2 shows that there is an increase of scores of the respondents in the post-test conducted. The score of 17 was the highest obtained by respondent numbers. 7, and 18 with a percentage of 85% with a scale of Mastered, while the score of 9 was the lowest obtained by the respondent no. 13 with a percentage of 45% scaled as Not mastered. The E-SIM also indicates significant results in terms of operating the basic MS applications needed to use the intervention with only 4 respondents were able to commit mistakes in using the E-SIM.

Table 1. PRE-TEST RESULTS OF SCIENCE 8 RESPONDENTS

RESPONDENT	Highest Possible Score	Actual Score	Percentage	Mastery level	Number of mistakes in operating E-SIM
1	20	5	25%	Not Mastered	2
2	20	9	45%	Not Mastered	3
3	20	7	35%	Not Mastered	1
4	20	2	10%	Not Mastered	5
5	20	8	40%	Not Mastered	0
6	20	5	25%	Not Mastered	0
7	20	9	45%	Not Mastered	2
8	20	5	25%	Not Mastered	0
9	20	7	35%	Not Mastered	0
10	20	9	45%	Not Mastered	3
11	20	4	20%	Not Mastered	0
12	20	5	25%	Not Mastered	4
13	20	1	5%	Not Mastered	0
14	20	8	40%	Not Mastered	0
15	20	2	10%	Not Mastered	1
16	20	4	20%	Not Mastered	0
17	20	7	35%	Not Mastered	2
18	20	8	40%	Not Mastered	1
19	20	2	10%	Not Mastered	4
20	20	8	40%	Not Mastered	2
Total		5.75	28.75%	Not mastered	

Table 2. POST-TEST RESULTS OF SCIENCE 8 RESPONDENTS

RESPONDENT	Highest Possible Score	SCORE *Number of Items* 20	Percentage	Mastery Level	Number of mistakes in operating E-SIM
1	20	13	65%	Not Mastered	2
2	20	15	75%	Nearly Mastered	0
3	20	16	80%	NearlyMastered	1
4	20	15	75%	Nearly Mastered	2
5	20	15	75%	Nearly Mastered	0
6	20	13	65%	Not Mastered	0
7	20	17	85%	Mastered	0
8	20	13	65%	Not Mastered	0
9	20	16	80%	Nearly Mastered	0
10	20	15	75%	NearlyMastered	0
11	20	15	75%	Nearly Mastered	0
12	20	14	70%	Nearly Mastered	0
13	20	9	45%	Not Mastered	0
14	20	15	75%	Nearly Mastered	0
15	20	15	75%	NearlyMastered	0
16	20	14	70%	Nearly Mastered	0
17	20	15	75%	Nearly Mastered	0
18	20	17	85%	Mastered	0
19	20	15	75%	Nearly Mastered	0
20	20	16	80%	Mastery	0
Total		14.65	73.25%	Neary Mastered	

Table 3. COMPARATIVE PRE-TEST AND POST TEST OF SCIENCE 8 RESPONDENTS

RESPONDENT	PRETEST SCORE	Percentage	POST TESTS SCORE	Percentage	PERCENTAGE OF INCREASE	Number of mistakes in operating E-SIM (Pre-test)	Number of mistakes in operating E-SIM (Post-test)	operating E-SIM/Basic MS applications Mastery level
1	5	25%	10	50%	25%	2	2	BASIC MS application NEARLYMASTERED
2	9	45%	15	75%	30%	3	0	BASIC MS application MASTERED
3	7	35%	16	80%	45%	1	1	BASIC MS application NEARLYMASTERED
4	2	10%	11	55%	45%	5	2	BASIC MS application NEARLYMASTERED
5	8	40%	14	70%	30%	0	0	BASIC MS application MASTERED
6	5	25%	12	60%	35%	0	0	BASIC MS application MASTERED
7	9	45%	17	85%	40%	2	0	BASIC MS application MASTERED
8	5	25%	13	65%	40%	0	0	BASIC MS application MASTERED
9	7	35%	10	50%	15%	0	0	BASIC MS application MASTERED
10	9	45%	14	70%	25%	3	0	BASIC MS application MASTERED
11	4	20%	9	45%	25%	0	0	BASIC MS application MASTERED
12	5	25%	14	70%	45%	4	0	BASIC MS application MASTERED
13	1	5%	9	45%	40%	0	0	BASIC MS application MASTERED
14	8	40%	12	60%	20%	0	0	BASIC MS application MASTERED
15	2	10%	10	50%	40%	1	0	BASIC MS application MASTERED
16	4	20%	13	65%	45%	0	0	BASIC MS application MASTERED
17	7	35%	15	75%	35%	2	0	BASIC MS application MASTERED
18	8	40%	17	85%	45%	1	0	BASIC MS application MASTERED
19	2	10%	11	55%	40%	4	0	BASIC MS application MASTERED
20	8	40%	12	60%	20%	2	0	BASIC MS application MASTERED

Table 3 shows the percentage of increase of Science 8 respondents. The post-test percentage is being less with pre-test percentage. Respondents' numbers 3, 4, 12, 16 and 18 obtained the highest percentage of increase of 45%. On the other hand, respondent number 9 garnered the lowest increase of 15%.

Table 4. Summary of Results

Test/Percentage of Increase	Percentage	Mastery level
Pre-test	28.75%	Not Mastered
Post-test	73.25%	Nearly Mastered
Percentage of Increase	44.5%	

Table 4 shows the summary results of the respondents. From 28.75% obtained "Not Mastered" during pre-test it implies that there is an increase of 44.5 % after the intervention was made, the mastery level of the participant classified as "Nearly Mastered" with a percentage of 73.25%

6. Conclusion

The researcher, based on the results presented, concluded that;

There is a significant change on the percentage of scores and mastery level of the participants. It is evident that the intervention made was relevant to the learners. The result also indicated that it can help the students to have better understanding about the complicated concepts and problem solving skills in learning Mendelian Genetics Dihybrid Cross. Lastly the E-SIM proved that the learners were ICT equipped and it is more engaging to the students.

References

[1] Cordova, R., Medina, J. G., & Ramos, T. (20019–06-19). *Effectiveness of Competency-Based Strategic Intervention Materials in English 7*. Dlsu.edu.ph https://www.dlsu.edu.ph/wp-content/uploads/pdf/conferences/research-congress-proceedings/2019/lli-II-019.pdf

[2] Dacumos, L.(2016).*Perspective of Secondary Teachers in the Utilization of Science Strategic Intervention Material (SIM) in Increasing Learning Proficiency of Students in Science Education.* **A**s TEN Journal of Teacher Education.vol. 1 issue

[3] Escoreal, A. (2012). Strategic intervention material: Atool to reduce least learned skills in grade 4 science.