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Decoding 1511's Fm 5: Express Learning of Form 5 Science Concepts

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Abstract

A sharp increase in positive cases of Covid - 19 infection could result in the closure of schools at any time. This will of course disrupt the process of physical learning sessions and further delay the delivery of all Learning Areas to students. This study was conducted to see the extent of the effectiveness of the proposed Form 5 Core Science Content Standard delivery method. The method is named Decoding 1511's Form 5: Express Learning of Form 5 Science Concepts. Form 5B students of SMK Balai Ringin were divided into 8 groups. Each group was assigned 3 Form 5 Content Standards to be decoded to form a brief note. To find out the impact of this method, a questionnaire was distributed to these 5B students via online. The results of descriptive data analysis found that 39 students agreed that they could understand the content presented by their peers. This method will be continued as to complete the remaining 5 Content Standards that have not been presented.

Keywords: Decoding 1511, Express Learning, Form 5 Science, Science Concepts.

Refflection Of Teaching and Learning

The year 2020 and the year 2021 are very challenging years in doing and carrying out the teaching and learning process. This Covid - 19 pandemic resulted in prolong school closures and disrupted the physical learning session (PdPc) process. Home-based Learning Method (PDR) has been introduced and implemented to ensure that students do not fall behind in lessons.

However, student involvement in PDR is very minimal and not encouraging. From January until before the school reopening on April 5, 2021, Teacher only managed to complete Chapter 1 of Form 5 Science with 5B students. This is because every time a PDR class takes place, an average of only 22 students participated. If this continues, then many students will be left behind. Furthermore, it is unfair for the students present if the Teacher repeats the learning that has been conducted online during PdPc session if schools reopen. So with this, the idea arose to carry out the method of "Decoding 1511's Fm 5: Learning Science Concepts Form 5 Express".

The choice of the name of this method is taken from the inspiration of the film The Da Vinci's Code. In this film, Robert Langdon unravels the secret codes on the work of Leonardo Da Vinci. In the case of this study, students will be given a Content Standard (CS) and the CS

will be summarized into a form that is easy to understand either in the form of a mind map, diagram or table. 1511 is the Science subject code that has been set by the Malaysian Examinations Board (LPM).

This action research was conducted according to the Kemmis & McTaggart (1988) Model. One cycle of this action research has four steps starting from Reflection or Preliminary Survey. The next step is to plan action, implement action and observe and the last step is to reflect.

Literature Review

Disruption by Coronavirus disease (COVID -19 caused by the newly discovered coronavirus (World Health Organization (WHO), 2020) has affected the economic sector of every country in the world, including the education sector. These effects include social distance, quarantine process, segregation measures, closure of campuses and schools, closure of borders and travel restrictions (QS, 2020)

The spreading of the disease as well as physical class sessions postponement, online learning through the use of several devices such as computers, laptops, tablets and mobile phones with internet access has become an alternative learning method. According to Singh and Thurman, 2019, through this method and learning environment, students should have more freedom in learning, as well as being able to get connected with their teachers anywhere they wish.

However, this online learning is quite difficult for the disabled, underprivileged, and students living in rural areas where resources and access to online learning are limited. The inability to access and engage in online learning causes dropouts and lowers their morale. Online learning also requires students' commitment and discipline, especially for vulnerable students where it requires a high level of physical interaction that enables them strengthen their social skills (UNESCO IESALC, 2020).

In Malaysia, the term Home-based Learning Method (PDR) is used to describe this distance teaching and learning . General guidelines of the operation of the PDR during this pandemic were provided by the Ministry of Education to ensure that learning and teaching took place during the period of movement control . The guidelines also provide alternative methods for teachers to conduct lessons in four modes, namely online, offline, mixed (a combination of online and offline), and off -site. This initiative is in line with UNESCO recommendations and ensures that distance learning programs aim to be inclusive, incorporate appropriate approaches, limit the number of applications and platforms used, develop distance learning rules, and actively monitor student learning.

This method is undoubtedly is an effective alternative learning method for students and educators during the movement control restriction, however, there are some problems that need to be considered. The main problem is the limited access to the internet. Many pupils and students throughout Malaysia do not have good access to the internet due to inadequate infrastructure (Harian, 2020). Inadequate online learning infrastructure and limited access to the internet make the online learning process more difficult for students (Lee, 2020), especially in more rural and remote areas in Malaysia. According to Aiman, 2020, a large

number of students are dissatisfied with the implementation of virtual learning modes during this epidemic. In addition to limited internet access, students experienced difficulty communicating with lectures, interacting with their peers, and lab access, which affected their studies.

To overcome this constraint, opportunities of PdPc sessions should be optimized and maximized by teachers. This is to ensure that all important Content Standards (CS) that need to be conveyed to students can be done. In the event of a re-closure of schools or higher institutions, the PDR session will only in the form of tutorial sessions and discussion sessions. These can reduce the gap between students who can participate in the PDR and students who have constraints in participating in the PDR.

Focus of the Study

There are 9 Learning Areas (BP) contained in the Form 5 Science subject. The first BP which is Microorganisms, has been done by Teacher during PDR sessions since January. The PdPc session which will start on 5 April 2021 until 28 May 2021 is a period of time that should be fully utilized by teachers to introduce and complete the remaining 8 BPs contained in the Form 5 Science subject.

The 8 BPs consists of 24 Content Standards (SK). If the 5B students are divided into 8 groups, then each group will get 3 SKs to be decoded. If the students successfully presented 4 SKs during the PdPc Science period, then roughly the students of 5B will be able to learn and know each concepts and theory of Science contained in each SK Science Form 5 by the end of April.

Research Objective

General Objectives

The main purpose of this study is to ensure that all the basic concepts in Form 5 Science syllabus are successfully presented during the physical PdPc session before the school closure which may occur at any time due to increase number of positive cases in Covid-19.

Specific Objective

1. Students will know all the basic concepts in Form 5 Science syllabus in a short time.
2. Students can understand well the basic concepts of Form 5 Science introduced.

Target Groups

Studenst from Form 5B, SMK Balai Ringin, which consists of 15 boys and 24 girls.

Research Questions

1. Can the method of Decoding *1511's Form 5: Express Learning of Form 5 Science Concepts* help in speeding up the delivery of all the basic concepts of Form 5 Science?

2. Can the students understand the basic concepts of Form 5 Science introduced through *Decoding Method 1511's Form 5: Express Learning of Form 5 Science Concepts*?

Implementation of Actions

Problem Overview

Unsatisfactory student involvement during PDR sessions created a knowledge gap between students. Among the reasons for the lack of involvement during the PDR session were the constraints of internet coverage and the level of sophistication of the respective students' devices.

Problem Review Analysis

Poor student involvement each time PDR is conducted causes an imbalance in student knowledge acquisition. This means, students who are present during PDR will get knowledge input while students who are not present will be left behind.

The situation will be complicated when physical PdPc sessions begin, where teachers are stuck in a dilemma. The dilemma of continuing teaching new learning standards or to repeat the content of learning standards that have been carried out during PDR to accommodate students who do not attend PDR. As for this 5B class, as mentioned earlier, the Teacher has completed the learning of Chapter 1: Microorganisms during PDR mode. The table below shows the number of students who attended each time the Teacher conducts PDR session was with them.

5b Student Attendance Schedule During PDR
(25 January 2021 - 04 April 202 1)

Date	Field of Study	Content Standard	Reflection
27.01.21 Week 1	Microorganisms	1.1 World of Microorganisms	Number of students 5B: 39 PDR attendance: 22/39
03.02.21 Week 2	Microorganisms	1.1 World of Microorganisms	Number of students 5B: 39 PDR attendance: 19/39
10.02.21 Week 3	Microorganisms	1.2 Useful Microorganisms	Number of students 5B: 39 PDR attendance: 15/39
18.02.21 Week 4	Microorganisms	1.2 Useful Microorganisms	Number of students 5B: 39 PDR attendance: 20/39
22.02.21 - 26.02.21 Week 5	SPECIAL PROGRAMME WITH SPM 2020 CANDIDATES LAST MINUTE SCIENCE REVISION BEFORE SCIENCE EXAMINATION		
01.02.21 - 05.02.21 Week 6	SPECIAL PROGRAMME WITH SPM 2020 CANDIDATES LAST MINUTE SCIENCE REVISION BEFORE SCIENCE EXAMINATION		
08.02.21 - 12.02.21 Week 7	SPECIAL PROGRAMME WITH SPM 2020 CANDIDATES LAST MINUTE ADDITIONAL SCIENCE REVISION BEFORE ADDITIONAL SCIENCE EXAMINATION		
17 .03.21 Week 8	Microorganisms	1.3 Prevention and Treatment of Diseases Caused by Harmful Microorganisms	Number of students 5B: 39 PDR attendance: 20/39

24 M ac 2021	Microorganisms	1.3 Prevention and Treatment of Diseases Caused by Harmful Microorganisms	Number of students 5B: 39 PDR attendance: 21/39

Actions Taken

As the physical PdPc session begins on April 5, 2021, Teacher straight away assigning the 5B students into 8 groups. A total of 8 learning areas; which consitst of 24 Content Standards is to be distributed to the 8 groups of 5B students.

The distribution of the 24 Content Standard (SK) is done by casting lots, to ensure a fair distribution of Content Standard (SK). The following table shows a list of students' names by group as well as the Content Standard (SK) that they will 'decode ' or study.

Distribution of Content Standard According to Group

Group	Decoded Content Standards
Aeron Fender Adrian	3.2 Environmental Pollution 4.1 Introduction to Rate of Reaction 5.1 Introduction of Carbon Compounds
Alexson Nata	3.1 Product Life Cycle 4.2 Factors Affecting the Rate of Reaction 7.2 Optical Instruments
Ammanuel Johnda	2.2 Nutrient Requirements in Plants 2.6 Foods & Supplements 4.3 Application of Rate of Reaction
Augustin Milton	2.5 Food Processing Technology 3.3 Environmental Preservation & Conservation 5.2 Hydrocarbons
Beckham Mansu	2.3 Nitrogen Cycle 7.1 Formation of Image By Lenses 9.2 Global Positioning System (GPS)
Boniface Bedindang	5.4 Fat 5.5 Palm Oil 8.1 Pressure In Fluids
Catherine Siena	2.1 Balanced Diet & Calorific Value 5.3 Alcohol 6.1 Electrolytic Cells
Cemelie Empie	2.4 Food Production Technology 6.2 Chemical Cell 9.1 Satellites

Starting from 5 April 2021 (Monday) until 11 April 2021 (Sunday), each student, with respective group members will decode the respective Content Standards. The concept or Science theory that was extracted was translated into a simple form according to their respective creativity. Each Group is supplied with manila cards and markers.

During the first week of Science PdPc period, students will be with their respective groups to carry out decoding activities. Undoubtedly there will be some Content Standards that are quite difficult to understand. Students may ask questions froTeacher, who acts as a facilitator, giving them ideas and opinions.

Presentation of The Decoded Content Standard

The presentation of the Decoded Content Standard is done during every PdPc Science starting 12 April 2021. In addition, Teacher have added one extra session on every Monday afternoon at 2.30 pm to 4.00 pm. The following is the implementation schedule and Teacher's reflection of every presentation session.

Date	**Time**	**Content Standards presented**
12 April 2021 Monday	11.30 am - 12.50 pm	2.1 Balanced Diet & Calorific Value 2.2 Nutrient Requirements in Plants 2.3 Nitrogen Cycle 2.4 Food Production Technology
Notes: Each group was given 12 minutes for a presentation. 2 minutes for question and answer and 1 minute for presentation transition. Teacher make sure that each group is on time in presenting their decoded Content Standards.		
12 April 2021 Monday	2.30 pm - 4.00 pm	2.5 Food Processing Technology 2.6 Food & Supplements 3.1 Product Life Cycle 3.2 Environmental Pollution 3.3 Environmental Preservation & Conservation
Notes: Since this session is conducted after school, 5 Content Standards will be presented. As with previous presentation sessions, each group was given 12 minutes for a presentation. 2 minutes for question and answer and 1 minute for presentation transition. Teacher make sure that each group is on time in presenting their decoded Content Standards.		
14 April 2021 Wednesday	10.50 am - 11.30 am	4.1 Introduction to Rate of Reaction 4.2 Factors Affecting the Rate of Reaction
Notes: This session is only one period, only 40 minutes. Therefore, only 2 Content Standards will be presented. Each group was given 12 minutes for a presentation. 2 minutes for question and answer and 1 minute for presentation transition. Teacher make sure that each group is on time in presenting their decoded Content Standards.		
15 April 2021 Thursday	11.30 am - 12.50 pm	4.3 Application of Rate of Reaction 5.1 Introduction to Carbon Compounds 5.2 Hydrocarbons 5.3 Alcohol
Notes:		

Each group was given 12 minutes for a presentation. 2 minutes for question and answer and 1 minute for presentation transition. Teacher make sure that each group is on time in presenting their decoded Content Standards.		
19 April 2021 Monday	2.30 pm - 4.00 pm	5.4 Fats 5.5 Palm Oil 7.1 Formation of Image By Lenses 7.2 Optical Instruments
Notes: Each group was given 12 minutes for a presentation. 2 minutes for question and answer and 1 minute for presentation transition. Teacher make sure that each group is on time in presenting their decoded Content Standards.		
April 20, 2021: School was ordered to close due to a sharp increase in Covid 19 positive cases.		

Observation on Every Presentation Sessions

Pupils have done their presentations well. There were some questions posed to them and they could not answer. In this situation, the Teacher helps the presenter to give answer the question. The attendance of students on each presentation session was very satisfactory i.e. 100% attendance.

Reflection

At the end of each presentation, the Teacher will randomly ask to the students to test their understandings. All students who were asked to answer the questions managed to answer the questions well. During each presentation session, each student is ensured to always wear face mask as precaution and always sanitize their hands using hand sanitation.

Reflection of The Study

The sudden closure of the school starting 20 April 2021 has caused distruption to the presentation. As of 19 April 2021, a total of 19 out of 24 decoded Content Standard were successfully presented. This means, only five Content Standard have not been presented. The following table shows the list Content Standards that have not yet been presented.

Content Standards that have not been presented
6.1 Electrolytic Cells
6.2 Chemistry cell
8.1 Pressure In Fluids
9.1 Satellites
9.2 Global Positioning System (GPS)

Due to the school closure, an online questionnaire survey has to be conducted to find out the responses of the students on this Express Method. A questionnaire was sent to each students via Google form. Questionnaire method was conducted to find findings to answer the second research question. The second research question is whether the students

understand the basic concepts of Form 5 Science introduced through the Decoding Method 1511 's *Form 5: Express Learning of Form 5 Science Concepts* .

The constructed questionnaire consists of ten questions. Each item in the questionnaire is a mutiple answer consist of five choices according to the Likert scale. There is only one open question. Respondents indicated whether they strongly agreed, agreed, disagreed , disagreed or strongly disagreed with each item statement given . The details of the scale are as in the following table.

Scale	Interpretation
1	Strongly agree
2	Agree
3	Disagree
4	Do not agree
5	Strongly disagree

The survey in the form of Google Form was distributed through the Telegram app on May 5, 2021. Teacher gave 5B students 2 days to provide their responses. After 2 days, Teacher managed to get responses from all 39 5B students.

Findings from the Questionnaire

Findings of the study for the level of understanding and mastery of the basic concepts of Form 5 Science introduced through *Decoding Method 1511's Form 5: Express Learning of Form 5 Science Concepts* are as shown in the Table below.

Bil.	Item	Number of student					
		STS	**TS**	**KS**	**S**	**SS**	**MIN**
1	I found that the division of the sub -topics was fair.	0	0	2	20	17	4.38
2.	My friend and I worked well together to complete our presentation.	0	0	1	14	24	4.59
3.	My friend and I always ask our Science teacher if we have any doubts or questions in preparing presentation materials.	0	0	1	18	20	4.49
4.	The time allotted to us to complete the presentation was sufficient.	0	0	3	26	10	4.18
5.	I was able to understand the content as well as the Science concept which was presented by my friend.	0	0	6	24	9	4.08
6.	I was able to master the Science concept presented to me.	0	0	3	23	13	4.26
7.	The input that I gain from this express presentation helped me to study on my own at home during the school closure.	0	0	6	19	14	4.21
8.	I think I will be able to answer basic simple questions related to the Science concept easily.	0	0	2	20	17	4.38
9.	I can join in the PDR sessions at any time	1	17	16	3	2	2.69

Average mean score: 4.14
Level: High
Note: STS - Strongly Disagree, TS - Disagree, KS - Disagree, S - Agree, SS - Strongly Agree.

The objective of the second study was to find out the level of understanding of students after involving in the express learning method. Ten items were built to answer the research

questions related to this objective. Bases on the findings, the mean score for the first item was high at 4. 38 which showed that students agreed that the division of Content Standards done fairly, with a percentage of 51.3 % (*n = 20*).

Next, the findings showed that the respondents strongly agreed that they had worked well with their peers to complete the presentation with a relatively high mean score of 4. 59 which led to a percentage of 61.5 % (*n = 24*). It was also found that students strongly agreed that they would ask their teachers if they had any doubts with a mean score of 4. 49 which represents 51.3 % (*n = 20*) of students.

Findings from the fourth item showed that 92.3 % 5B's students agreed and strongly agreed (*n = 36*) with the time allocation given to them to complete their decoding as well as presentation materials.

Next, the fifth item is the most important item leading to the question on the objective of the second study. A total of 24 students, 61.5 % agreed and 23.1 % of the students strongly agreed that they could understand the Science concept presented by their peers during the presentation. The average mean score for this item was 4.08. Six students disagreed.

The findings of the sixth item showed a mean score of 4.26 which led to the statement that students agreed that they can master the Science concepts presented to them. This is proven through the findings which showed that 23 students agreed as well as 13 students strongly agreed that they can master the Science concept presented to them.

It was also found that the students agreed that the knowledge they gained could help them to learn on their own during PDR; with a mean score of 4.21, which represents 33 students. This is shown through the findings on the seventh item.

The findings of the eighth item showed a mean score of 4.38 which led to the statement that the students are confident that they will be able to answer the basic questions from the Science Concepts that have been presented to them. This is shown through the findings which showed that 20 students agreed (51.3%) as well as 17 students (43.6%) strongly agreed that they were able to answer the basic questions from the Science Concepts that were presented to them.

The ninth Item of the Questionnaire shows that 41 % of the students (n = 1 6) disagreed that they could follow the PDR class easily and conveniently. While 43.6 % (n = 1 7) did not agree that they could not follow and attend the PDR class.

The reason for this ninth item is stated in the tenth item. The tenth item is an open question in which the item asks them to state the main problem in participating in PDR. The findings shows that 27 students stated that the main problem that prevented them from participating the PDR was the problem of internet access. Among other responses - students expressed the lack of focus while studying at home (2 people), lack of understanding of learning content (2 people), no enthusiasm to learn from home (2 people), distracted with daily home chores (1 person) and stress due to piles of online homeworks (1 person). While the other four respondents did not provide any response on this item.

Positive Impact of Decoding Method 1511's Fm 5: Express Learning of Form 5 Science Concepts

Through the implementation of this method, the Content Standards of Form 5 Science Learning Area can be delivered in a faster pace. The 5B students participated in this activity have shown a positive attitude and gave a high cooperation while doing their respective tasks. This attitude might be triggered of their awareness and impact of the Covid 19 restriction orders.

The 5th questionnaire item shows that this method has an impact on the learning attitudes of these 5B students. 84.6 % or a total of 33 5B students could understand their peers' presentations. For the 6th item of the questionnaire , a total of 9 2.4 % or a total of 36 students agreed that they can master the Science concept presented to them.

The 8th item of the questionnaire , 9 4.9 % or 3 7 5B students are confident that they are able to answer short questions based on the concept of Science that has been presented to them. This means that they can apply the knowledge gained during the presentation.

School closures due to an increase in Covid -19 positive cases occurred on April 20, 2021, to some extent affecting the course of this activity or method. Nevertheless, the 5B students successfully presented 19 of the 24 Content Standards. This achievement is very outstanding; regardless of the difficulty faced by the students. This also shows that the students are serious in doing their task as well as possessing high discipline. This is due to awareness of the implications if they fail to finish up the science syllabus content. They have had already experienced it since PKP 1.0 2020.

The closure of the school on April 20, 2021 also causing this mini study could not be completed. However, the results of this main study provide inspiration and new ideas to teachers to continue and refine the Decoding Method 1511's Form 5.

Negative Impact Decoding Method 1511's Fm 5: Expressive Learning of Form 5 Science Concepts

Science learning requires methods of exploration and student -centered learning. This is mainly done by doing investigation and experimental activities in searching for answers in Science. Science Process Skills need to be applied in parallel with the learning and exploration of a science concept.

Through the method of Decoding 1511's Form 5, the Science Process Skills application was put aside. This is because, the main objective of this study is first to learn all the Science concepts contained in all Areas of Learning.

Therefore, a further action should be taken after this to ensure that the elements of Science teaching through the process of exploration and investigation are done. This is to polish and further strengthen students' mastery of Science concepts through the application of their Science Process Skills.

Conclusions and Suggested Follow -Up Actions

Through the implementation of this method, the Content Standards in the Form 5 Science Learning Area can be delivered in a faster pace. Students involved in this activity have shown a high attitude and giving a good cooperation while performing their respective tasks. This attitude may be triggered by they awareness of already implications of the impacts of Covid-19 restrictions. Follow-up actions from this study that has to be done upon the reopening of the school

1. Presentations of 5 sub -topics that have not been presented.
2. Module Decoding 1511 will be modified into a formal document so that all the contents of the presentation can be used as one of the student reference sources.
3. The Science Process Skills Module must be published in line with this Decoding Module 1511 to further strengthen students' knowledge through the Inquiry-Based Learning method.

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APPENDIX

https://docs.google.com/forms/d/1hmCzMS8IQGTz2DM0GNqct8lHBA5PEC5Jaztp8dHsFII/edit?usp=sharing

Link of Survey questions sent to respondents via Class 5B Telegram in the form of Google Form.

https://docs.google.com/spreadsheets/d/1Pa2rTwWTfIhaDgusnueAzWcNR_uVq7lbXo3U0ek7-fM/edit?usp=sharing

Link Findings from Respondents

https://drive.google.com/file/d/1YEqwCEyMkbbpyldgvd57VO-rP4ooZW-Z/view?usp=sharing

List of names of 5B students of SMK Balai Ringin