Winning the War against Diabetes in MJR

Using Building Learning Power

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7 Key Elements

▪ Inquiry
▪ Goals
▪ Task and Audience
▪ Instructional Plan
▪ Cumulative Demonstration of Learning
▪ Evaluation
▪ Feedback

Learning muscles = learning dispositions

Collaboration

Making links

Meta-learning

Food & Nutrition

Building Learning Power

Biology
Element 1: Inquiry

What aspects spark your thinking? What is worth pursuing?

Creating an opportunity for cross-departmental collaboration, allows:

• a shift from standardised learning experience, and
• teachers to grow their expertise in **Content**, **Pedagogy** and **Assessment**.
What are the learning intentions?

How do we know if the learning intentions are met?
Element 1: Inquiry

Area of Focus
- Interdisciplinary learning

STP (Lesson Enactment)
- Activating Prior Knowledge
- Questioning
- Collaboration
- Concluding the lesson

BLP
- Making links
- Meta-learning
- Collaboration

Theory
Design
Practice
STARTED IT
In your opinion, which are the learning muscles important in interdisciplinary learning? [www.menti.com][85 06 87]
Element 2: Goals

What are the desired results?

Subject-specific

Cross-disciplinary

Dispositional
Element 2: Goals

Teaching and Learning Activities
Learning tasks and activities are designed to promote **interdisciplinary learning** (Biology & Nutrition and Food Sciences) where students are required to work together (**BLP: Collaboration**) to **activate their prior knowledge** and make links (**BLP: Making Links**) in order to construct and co-construct new knowledge.

**STP:** Collaboration, Activating Prior Knowledge, Questioning

Assessment
Learning **progressions** are developed to support acquisition of knowledge and skills in a continuum that suits learners’ profile.

**STP:** Questioning, Concluding the Lesson

Success Criteria
Students think critically and analyse (**BLP: Meta-learning**) how parts of a whole interact with each other to produce overall outcomes in complex situations.

**STP:** Collaboration, Activating Prior Knowledge, Questioning, Concluding the Lesson

Learning Intention
To provide an **authentic learning experience** through analysing and solving the real-world problem. Students should be able to gain awareness of the **meaningful connections** that exist among the disciplines.

Theme: ‘Let’s Beat Diabetes’!

Scaffolding and Feedback
Learning activities are varied and sequenced where more complex tasks are built upon fundamental ones. Transitional activities cater time for feedback and feedforward to build the habit of remaining open to continuous learning (**BLP: Meta-learning**).

**STP:** Questioning, Collaboration, Concluding the Lesson

Questioning
Asking interesting and thought-provoking questions increases resourcefulness and reflectiveness (**BLP: Meta-learning**) and as a result shapes learning with greater sense of ownership and depth.

A series of **essential questions** frames the process of interdisciplinary learning, and assessment goals align with these essential questions.

**STP:** Questioning, Activating Prior Knowledge
Goals & Professional Learning Structure

Goals Identification:
- Interdisciplinary learning
- Build learning dispositions such as
  - Meta-learning
  - Collaboration
  - Making Links

Group Reading:
- STP (Lesson Enactment)
- Learning Intentions
- Success Criteria
- Learning Progression

Designing Phase (C-P-A):
- Use of SLS PS
- Scope lessons and activities to ensure students acquire the basics and are allowed to perform more complex tasks/

Implementation/ Review/ Evaluate/ Feedback
- Activating Prior Knowledge
- Making links while facilitating completion of task.
- Concluding Lessons
Element 3: Task and Audience

How does audience shape creation and communication?

- biology
- food & nutrition

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Element 3: Task & Audience
Element 3: Task & Audience

In your opinion, which are the biology and nutritional concepts relevant in this theme?

www.menti.com [85 06 87]
Element 4: Instructional Plan

What does designing a learning plan look like?

Area of Focus
- Interdisciplinary learning

STP (Lesson Enactment)
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- Concluding the lesson

BLP
- Making links
- Meta-learning
- Collaboration
Element 4: Instructional Plan

Area of Focus
Interdisciplinary learning

Learning Progression

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**Activate Learning**

1. Understanding Group Task
2. Groupings & Think-Puzzle-Explore

**Promote Thinking and Discussion**

3. [BIO] Hormones and Endocrine Glands
4. [BIO] Regulation of Blood Glucose Concentration

5. [FN] It is Hidden...
6. [FN] Revealing the Truth
7. [FN] Sugar Limit or Limit Sugar?
8. [FN] Health and Sugar
9. Knowing the Glycemic Index

**Facilitate Demonstration of Learning**

10. The Final Task
11. Consolidation of Learning
Element 5: Cumulative Demonstration of Learning

How do we show evidence of learning over time?
Provide students with background information to set context and trigger thinking.

Diabetes is a “health crisis” for Malays and Indians, Mr Lee said. In his Malay speech, PM Lee said alarmingly, 17 per cent of Malays in Singapore have diabetes - and one reason for this is obesity, which is more prevalent among Malays. He said that Malay-Muslim organisations have been working with the Health Ministry to spread the message about diabetes.


For Biology students, you would have viewed the video on 'Diabetes' during the e-Learning activity and learnt how the hormone, insulin, helps to control the blood glucose concentration within a healthy normal limit.

For F&N students, please watch the video below.

STP (Lesson Enactment)

- Activating prior knowledge
- Questioning
- Collaboration
- Concluding the lesson
STP (Lesson Enactment)

- Activating prior knowledge
- Questioning
- Collaboration
- Concluding the lesson

(i) Activate Learning

THINK–PUZZLE–EXPLORE

Stretch muscle of “Making Links”, “Meta-learning” through the use of Thinking Routines

<table>
<thead>
<tr>
<th>THINKING ROUTINE 1</th>
</tr>
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<tbody>
<tr>
<td>1. Think</td>
</tr>
<tr>
<td>This is familiar because...</td>
</tr>
<tr>
<td>... feels the same as ...</td>
</tr>
<tr>
<td>... helps me recall the concept of ...</td>
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What do you think you know about this topic? | What question(s)or puzzle(s) do you have? | In relation to Biology and/or F&N, what does the topic make you want to explore?

✓ Making Links ✓ Meta–learning
Using Thinking Routines: Think–Puzzle–Explore

STUDENTS’ RESPONSE

THINK THIS IS FAMILIAR BECAUSE... ... FEELS THE SAME AS .... ... HELPS ME RECALL THE CONCEPT OF ...

This is familiar because my maternal grandmother and my dad has diabetes. They both often have to take insulin injections and they can’t get hurt as their blood will not clot and they will be in danger.

PUZZLE HOW DOES .... LEAD TO .... WHAT IS THE RELATIONSHIP OF ... WITH ...

How does one get diabetes and what is the chance/risk of getting diabetes if your family member has it?

EXPLORE TO RAISE AWARENESS OF DIABETES, WE SHOULD EXPLORE HOW/ WHAT... RESULTS IN ....

This makes me want to explore the possibilities of how to help those people with diabetes have an easier life and is there a better and more efficient way of treatment/lifestyle choices for them.
(ii) Promote Thinking and Discussion

3. [BIO] Hormones and Endocrine Glands

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9. Knowing the Glycemic Index
Students displayed their understanding by showing the relationship of the key terms across biology and f&n after watching a video.

Response

Carbohydrates are mainly glucose which is broken down in the intestine. Glucose leaves the intestine through the hepatic portal vein into the liver when energy is needed and bypass it when the liver has enough energy.

Fructose in the intestine is also delivered directly to the liver even when it has enough energy. The enzyme present in the liver is always functioning therefore, lesser fructose is delivered to the body which leads to fructose overload, where it needs to start storing fructose as fats.

When there is an increase in liver fats, it leads to more fats heading out to blood, which increases the amount of triglycerides and cholesterol in the bloodstream therefore increasing the risk of cardiovascular diseases. Liver fats also decrease insulin's ability to do its job, increasing the risk of diabetes.
(iii) Facilitate Demonstration of Learning

Facilitate Demonstration of Learning

10. The Final Task

11. Consolidation of Learning

Let's Beat Diabetes

- Trend of diabetes in Singapore
  - One in 3 Singaporeans have diabetes, with higher rates among those who are older. Example: of those aged 50 and above, 3 in 10 have diabetes.
  - The racial prevalence of diabetes among those above age of 50 is 2.5 in 10 for Chinese, 5 in 10 for Malays, and 6 in 10 for Indians.
  - Obesity is one of the causes of diabetes.

- How does food choices and consumption cause diabetes?
  - Most food contains hidden sugar in different ways in ingredient list (such as dextrose, modified starch).
  - Examples of food that contains hidden sugar - instant oatmeal, yoghurt, granola bars, energy drinks.
  - Poor food choices and consuming excess sugars can lead to weight gain and also increase in blood sugar levels (high risk of getting diabetes).

- Causes of diabetes - hormones
  - After a meal is eaten, carbohydrates will be broken down into glucose, which increases the blood glucose level in the body.
  - Insulin will be released by the pancreas.
  - Insulin helps control blood glucose levels by converting excess glucose into glycogen, which will be stored in the muscles hence, lowering the blood glucose level in the body.
  - When the blood glucose level is low, the pancreas will release glucagon into the blood, which will break down glycogen to glucose, hence blood glucose levels will increase.
  - With this two hormones, will then the blood glucose levels be properly controlled.

- Ways to prevent diabetes with food choices
  - Low GI food (55+)
    - Food with carbohydrates are more slowly-digested, absorbed and metabolised.
  - High GI food (<70)
    - Fruits, vegetables, whole grain cereals

- Ways to prevent diabetes
  - Eat a balanced, healthy diet
    - Cut sugar and refined carbs from your diet as it can result the rise of blood sugar in the body.
    - Consume more food that is high in fiber - fruits, vegetables, whole grain cereal

- Making Links

- Collaboration
Element 6: Evaluation
How is learning evaluated?

1. Goals
2. Teaching Points
3. Learning Activities
Element 6: Evaluation

How is learning evaluated?

I understand the core ideas and concepts in this project.

19 responses

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<tr>
<th></th>
<th>Count</th>
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</thead>
<tbody>
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<tr>
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<td>0%</td>
</tr>
<tr>
<td>Neutral</td>
<td>-3</td>
<td>15.8%</td>
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<tr>
<td>Agree</td>
<td>15</td>
<td>78.9%</td>
</tr>
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State three example of a concept constructed from the muscle of Making Links.*

1) Apply the prevention ways of getting diabetes to lifestyle.
2) Share knowledge or advice to people who needs it as they can link to it.
3) Can prevent diabetes by early detection.

State three example of a concept constructed from the muscle of Making Links.*

- types of diabetes
- definition of diabetes
- effects of diabetes
Element 6: Evaluation

How is learning evaluated?

State what you have valued during the collaboration in this project.

1. Teamwork
2. Learning experience

I am able to apply the knowledge I have gained through the course of this project in my daily life.

19 responses
Element 6: Evaluation

How is learning evaluated?

The project helped me appreciate the significance of the subject matter.

- 19 responses

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From your learning experience, how would you raise the awareness of others in fighting against diabetes.*

- have talks in schools during mass assembly
- Remind them to eat healthier food options compared to what they want to eat every time I eat with them or see them
- Start small by sharing with family members, especially the elder ones, and friends.
Element 7: Feedback

How does feedback promote growth?
Thank you for your attention