Learning with and through Phenomena: An explainer on Phenomenon Based Learning

Sam Tissington, August 2019

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Phenomenon based learning is a holistic approach to education where students learn through topics and themes rather than subject areas. It is a rejection of the dominant silo-based approach to learning where subjects are taught in isolation. Students apply concepts from a range of disciplines, including science, arts, math and literacy to solve the problems they are studying.

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1. What is Phenomenon Based Learning?

Examples

Instead of studying ‘mathematics’ for 50 minutes, then ‘literacy’ for 50 minutes, then ‘history’ for 50 minutes, integrate the subjects into the study of one phenomenon.
For example, a phenomenon might be “The Olympics”. To study the Olympics, you might explore:

- Its environmental impact (social studies),
- The lifestyles of elite athletes (health),
- The ancient Olympics (history), or
- How many times a bicycle wheel turns in a 1000m bike race (mathematics).

**Purpose**

Phenomenon Based Learning (PhBL) aims to teach subject areas concurrently rather than separately.

Students aim to apply knowledge from a range of subject-area disciplines to solve problems that they may face in real life.

The **purpose** is to:

- more effectively integrate different disciplinary knowledges so students see connections between what they learn;
- understand how disciplinary knowledges can support one another to solve problems; and
- understand how approaching a topic from multiple disciplinary approaches can provide a more holistic understanding of a topic.

## 2. Key Features of Phenomenon Based Learning

**A Constructivist Pedagogy**

A Phenomenon based approach is grounded in constructivist theory. The **constructivist theory of learning** holds that students learn through ‘mulling over’ concepts in their mind rather than simply absorbing facts transmitted from their teacher.

In constructivism, students use active thinking skills to create connections between existing knowledge and current knowledge. When they encounter new knowledge, they critique it, try it out, and compare it to what they already know.

This approach is contrasted to **passive learning** where students have information transmitted to them and they try to memorize it.

Additional key pedagogical and theoretical links include:
- **Student Centered**: The educator acts as a facilitator and guide, allowing students the freedom to explore the concepts under analysis. The educator does not follow a one size fits all model as each student may be exploring a different problem. PhBL is student centered.
- **Active Learning**: Students learn by ‘doing’ and making connections between concepts in their mind, rather than a passive approach. PhBL is an active learning approach.
- **Project-based Learning**: Like ‘project-based learning’ (PBL), PhBL also focuses on students learning through projects rather than isolated lessons. Students can focus on a single project for a long period of time to allow immersion, discovery and developing expertise.
- **Problem-based Learning**: Students identify problems to solve, determine a range of possible solutions, and implement those solutions to solve the problems. In PhBL, the problem is usually related to a specific topic or ‘phenomenon’.
- **Social Constructivism**: Social constructivists embrace the idea that social interactions can help learning to progress. Through social interaction (such as group work), students learn from one another and support each other’s learning.

**Multidisciplinary Learning Modules**

The central feature of PhBL is its multidisciplinary focus. Rather than teaching subjects in silos, content is taught (and learned) in an integrated manner. Students complete projects that require the application of knowledge from multiple subject areas in order to succeed.

According to Symeonidis and Schwarz (2016), PhBL is a movement “away from traditional subject teaching and toward multidisciplinary learning modules.”

However, in practice, the multi-disciplinary aspect tends not to be practiced throughout an entire school day. Students tend to still learn specific topics through a structured, modelled, or guided learning approach (while cross-curricular links are encouraged).

A genuinely multidisciplinary module may be integrated into the schedule for part of the day, for example on one project to be done each afternoon.

For example, in the Finish system, students complete one genuinely multidisciplinary module per year, while other modules that provide focused instruction on one topic remain the norm.

**Real-World Focus (Authenticity)**
PhBL is designed to help students learn in more authentic, real-life scenarios. In 21st Century workplaces, workers are increasingly needing to use critical and creative thinking skills to solve problems rather than follow structured tasks that exclusively require one domain of knowledge.

To better prepare students for the real world, phenomenon-based learning selects a phenomenon, topic or theme. The teacher then requires students to explore their topics using all the knowledge and resources they have available to them from all subject areas. This should reflect real life situations rather than the sanitary environment of a single-subject classroom.

**Student Led**

Students are given the freedom to identify their problems and work on defining solutions. In PhBL, students tend to work in groups to solve problems.

For example, the educator might provide a general phenomenon or topic (say: spiders, gravity, or poverty) and ask students to do research to identify a problem. Once they have identified the problem, they will need to demonstrate how they used a range of disciplines (mathematics, science, literacy, arts, etc.) to come up with a solution.

**Research and Discovery**

Like inquiry-based learning, PhBL asks students to engage in research and discovery to succeed in their tasks. Students are required to engage with their environment and use inductive and deductive thinking to reach conclusions.

Here’s the difference:

- **Deductive inquiry**: Students test generalizations and hypotheses to come to a clear conclusion on a topic. They start with a theory and use observation to test if it is true.
- **Inductive inquiry**: Students have to use their observational skills to identify patterns in their environment and make predictions and generalizations based on their observations. They start with an observation and create a generalized theory based on what they see.

The students are presented a phenomenon and they need to use these types of thinking skills and cognitive skills to succeed in their tasks.

**3. Advantages and Disadvantages of Phenomenon Based Learning**
Advantages

PhBL has the following advantages:

- Students learn how to apply their knowledge to real-world circumstances.
- Students can come to see connections between different domains of learning.
- It emphasizes skills that are required for 21st Century workplaces.
- It highlights the importance of linking theoretical knowledge to practical situations.
- Students get a holistic perspective on the phenomena under analysis.
- Engagement can be enhanced because the focus is on solving problems rather than repetitively doing subject-based tasks.
- Students need to use group work, problem-solving, communication and logical reasoning skills to reach conclusions.
- Students are encouraged to learn in independent cooperative groups to solve large problems.
- Educators across different disciplines can collaborate to create projects for their students.
- Educators can use flexible table layouts rather than traditional classroom layouts to encourage group problem solving.

Disadvantages

PhBL has the following weaknesses:

- Not all classes can involve PhBL. Sometimes there’s a need for traditional direct or modelled instruction on a specific subject area. In the Finish system where PhBL is embraced, only one module per year of PhBL is required and the rest of the classes follow a silo approach.
- Students need to be trained on how to work in groups, identify problems, and conduct research in order for PhBL to be a success.
- The lack of structure in project-based learning approaches may be disconcerting to some students.
- Some phenomena may not need all disciplinary knowledges to solve their problems, leaving gaps in learning and practice.
- The open-endedness and student-led nature of PhBL makes it hard for educators to present challenges in the right sequence for optimal learning. For example, the sorts of knowledges required to solve some problems may not be at the right developmental level for the students, causing roadblocks in learning. The students may identify that they need an advanced mathematical skill to solve the problem under analysis, but they may not have the skills or knowledge yet to use that skill.
- There needs to be sufficient resources and support provided to students as they go about their work.
4. How to Teach about Phenomena

Some teaching strategies for PhBL include:

**Start with a Phenomenon, not a Subject**

Start a Lesson with a Phenomenon you want Students to Explore rather than a Subject Focus.

Instead of presenting a topic by stating: “We’re learning this today”, start with an engaging hook that is a ‘phenomenon’. For example:

- Introduce footage of waves and get students to explore reasons why waves may exist; or
- Present a smell to explore where and how that smell comes from.

**Build on Students’ Curiosity**

In Grade 5, my teacher asked the whole class to contribute ideas for topics they wanted to explore. I volunteered the topic ‘Castles’.

For a few weeks, the whole class learned about castles. We learned about the history of castles in Europe, we made portcullises, we wrote stories, and even had a go at creating a trebuchet. Science, history, mathematics and literature were all brought to bear on the study of the phenomenon.

If students come to class with curiosities, embrace them and see where the phenomenon takes you.

**Embrace Local Issues**

Phenomena can be identified from your local community. Community-based learning helps students to integrate into their communities, develop a sense of belonging, and develop a commitment to their local ecosystem.

Local issues can be identified through local newspapers, parents, or local businesses. Your community may have unique celebrations, landforms or cultural identities that may form phenomena for your class to explore.

Furthermore, in embracing local phenomena, the class has the chance to go on field trips to explore the topics in-person. This can help students to have an immersive and fulfilling PhBL experience.

**Embrace Current Affairs**
Current affairs can be invaluable resources for finding phenomena for learning and teaching. Allow students to present current affairs issues that are of importance or relevance to them.

For example, have students bring in newspaper clippings or news printouts with issues that the students are interested in.

If topics are of high importance to your school community or are pivotal national concerns, they can be used as learning opportunities in a PhBL approach. An earthquake or firestorm, for example, may provide an introduction to a topic on natural disasters that can employ history, geography, and other subject areas during analysis.

**5. Use in the Finland Education System**

Phenomenon based learning has been integrated into the Finish education system on a compulsory basis. In the 2016-17 school year, it became mandatory for all students to complete at least one multidisciplinary learning module per year.

According to Symeonidis and Schwarz (2016), this change in the Finish system represented “a rather substantial shift from the conventional classroom and current organization of concept- and subject- based education to a phenomenon-based and holistic paradigm for learning.”

**Final Thoughts**

Phenomenon based learning is a fascinating 21st Century approach to learning and teaching. It can inspire students’ curiosity and help them link subject matter that they’re learning to actual events in the real world.

There are still some challenges to PhBL. It’s hard to implement PhBL in all classes, meaning it can best be implemented as one part of a larger curriculum design. Nonetheless, its value is in helping students to apply knowledge from various subjects in a holistic way to help them make connections across subject areas.

**References and Further Reading**