Cross-curricular linkages – a foray into real-world education

~ Safa Abdul Razak

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Imagine that you are baking a cake. You read a recipe, prepare a shopping list, buy ingredients, weigh or measure them and get ready to make the cake batter. While preparing the batter, you mix the ingredients in the right order, using proportions and keeping track of how much time you whisk, beat and mix, at every step. In the meantime, you pre-heat the oven, and prepare the baking tins. There are various factors involved in this process of baking a cake – reading the recipe (Language), understanding measures, weights, proportions (Mathematics), ensuring the right mix of ingredients (Chemistry), and the right temperature (Physics), and so much more.

The example illustrates the need for a comprehensive, inclusive mode of education, where aspects of knowledge are not segregated into water-tight compartments of

'subjects' that are taught separately, as stand-alone components, but as a holistic model. In the ever-changing landscape of education, where new methodologies gain popularity at every turn, the idea of holistic education has remained popular for an extensive period of time.

Over the years, cross-curricular learning has been referred to by many names including *horizontal integration* and *interdisciplinary learning*. As the name signifies, this is a way of learning where different disciplines are combined to deliver a learning experience that closely resembles real-life situations. In this method, the topic or theme is common across 'subjects' and every subject is like a piece in a jigsaw puzzle. Every piece comes together to form the larger picture, or, in this case, the topic.

What are the benefits of cross-curricular linkages?

Linking a lesson across various disciplines has many advantages not just for learners, but also for educators. In order to plan an interdisciplinary lesson, teachers have to come together, brainstorm, plan and execute lessons in a collaborative manner, as opposed to being individuals who teach the curriculum in silos as per their stipulated plan. In the collaborative way, there is a healthy sharing of ideas, with teachers sharing their opinions, perspectives as well as their experiences and expertise. Another benefit of a combined approach to planning lessons is innovation and creativity. With brainstorming sessions and meticulous planning, the lessons can be a richer experience for both the learners and teachers. This ensures a higher quality of education than when each teacher plans lessons individually.

This method also creates an atmosphere of collaborative learning among students. Due to its student-centric approach, the learners are motivated to explore more on the topic among themselves, leading to increased interactions. Working together helps them to build socio-ethical and emotional skills, while maintaining positive mindsets and becoming active listeners. With real-world applications, these lessons are highly engaging for different types of learners. For example, a lesson that uses music to teach rhyme and symbolism could prove interesting to learners who love music, but do not express much interest in literature otherwise. Including a cross-curricular activity as homework also helps learners to engage with people outside of school, such as their families, neighbours and friends, further bridging the gap between school and home.

Cross-curricular linkages also help to highlight learner strengths, as there are multiple approaches to teaching the same topic. These multifaceted perspectives bring out the creative side of learners and help them to identify with the topic. For example, a learner who is often confused while solving mathematics problems, such as percentages or ratios, may find it easier to calculate while using two different ingredients in a science project. This enhances their ability to analyze issues comprehensively, rather than calculating isolated math problems that may not resonate with them. Similarly, a learner who feels that descriptive or narrative writing is limited to language learning, would be excited to write about an experiment they conducted.

Although subject-specific knowledge is of essence, a cross-curricular approach guarantees that the 21st century skills such as communication, collaboration, critical thinking and adaptability are developed, and there is a focus on how the learner performs everyday tasks outside the classroom, in the real world. It helps learners shift their focus from completing tasks in each book, to applying knowledge outside of the classroom.

Widely recognized as a holistic learning strategy, cross-curricular linkages also provide various ways in which students can tap into their innate learning abilities. The lessons can be designed to motivate learners to question, wonder, criticize, analyse and then arrive at a solution. This can help them to build strong interpersonal skills.

A cross-curricular approach also addresses multiple content areas, leading to enhanced cognitive development and deeper learning. It becomes the driving force behind recognizing strengths, biases and also working towards equality in learning opportunities. As learners learn in heterogenous ways, many proponents of this method perceive it as one that involves minimal cost but yields the maximum results.

How do we plan a cross-curricular lesson and curriculum?

Most of the educational boards have recognized the need for cross-curricular linkages in the classroom. Therefore, it is imperative that teachers and the school administration plan a curriculum where the lessons do not focus on single subjects, but on topics that include various ways to understand the same idea.

The first, and most preferred strategy is for teachers to choose a theme and work around it. For example, while teaching trigonometry, a teacher faced questions such as, ‘Why do we need to understand the angle between a ladder and the wall? Why is it important to understand sin, cos and tan?’ The teacher, after collaborating with the Science and English teachers, planned a trip to a lighthouse. The theme of their lesson was

a lighthouse. The Mathematics teacher used the height of the lighthouse, its proximity to the shore and the light beam to help learners understand one of the applications of trigonometry in the real world. The Science teacher contributed to this with concepts on light and refraction. He also spoke about optimal lenses to be used in the lighthouse. The English teacher introduced a famous story about an Australian crew that was lost at sea, and rescued, thanks to the beam of light from a lone lighthouse. To take the lesson further, the teachers gave the learners a group assignment where each group had to design a lighthouse based on the key mathematical and scientific concepts they had learnt, and present it to the rest of the class.

Another strategy that many educators rely on is choosing a key concept. This key concept forms the basis of a lesson that encourages learners to find out more about something, think critically, find solutions to problems after some research and also make connections between seemingly disconnected ideas. The main goal of this approach is to apply knowledge to solve a problem.

An integrated approach that has been the go-to method for many teachers, especially in recent years, is to establish a theme and then choose key concepts to guide the execution of the lessons. An important part of the planning process is to identify skills and strategies that the learners would use and develop throughout the lesson. The NCF document that the Central Board of Secondary Education published recently talks about the learning competencies that educators need to focus on. Similar documents could be a guideline while teachers plan their lessons. While the teacher plans the lesson, it is equally important to pay heed to the assessment strategies. Instead of completely relying on pen-and-paper tests, there are various ways to assess the learners at different stages of the lesson. A fun way to assess learners during the lesson is to ask them to create a song about what they have learnt thus far. While composing the lyrics as a group, learners delve into their knowledge of the subject, hum and try out tunes that they can use for the lyrics, help each other with information, and work together as a team. Therefore, there are opportunities for the teacher to assess the group's knowledge of the subject, their collaboration, communication and also teamwork.

The use of appropriate resources is also extremely important. For example, while choosing to teach a science concept such as reversible and irreversible changes, it would be more appropriate to use objects that learners see and interact with, such as torn paper, burnt paper, water and ice, fruit juice, sugar syrup, and so on, instead of chemicals that they would use only if they chose a particular branch of specialized study. While choosing resources, teachers are often encumbered by budget constraints and feasibility. Recycling, creating resources from used materials and also creating common templates can be helpful.

What should educators keep in mind?

Every educator likes to explore ways in which learning can be inclusive, engaging and holistic. Using cross-curricular linkages is a wonderful way to do so. Teachers can incorporate STEAM effectively in their classrooms in this way.

There are essentially three questions that the teachers can use to guide them towards a well-planned lesson that is balanced and effective.

- What are the benchmarks to achieve in each of the subject areas that are integrated in the lesson?
- What are the cross-curricular questions that the learners can answer?
- Does the assessment focus on a product or performance of the learner throughout the lesson?

The integration of language, mathematics, science and other subjects is beneficial for learners as it fosters critical thinking, creativity and innovation. Teachers can provide inclusive and engaging lessons when they plan lessons around key concepts that prepare learners for the complexities of the real world. Holistic learning strategies such as cross-curricular linkages can empower learners to develop essential skills for life-long learning.

Safa Abdul Razak is a CELTA qualified teacher with over a decade of experience in ESL teaching. She is an author and a resource person for several leading publications.

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Lesson plan – 4 ways to have cross-curricular linkages

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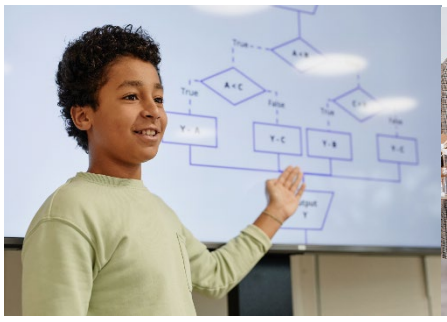
1. **Varied warm-up activities**
   Warm-up activities that include art, craft, songs, dance or movement are a great way to incorporate a cross-curricular link in the foundational years. Cross-curricular linkages in warm-up activities can also include projects such as creating mind maps, using projects and questions to introduce the topic. For example, when doing a poem about wildlife or animals, learners can be encouraged to draw their favourite animal, or a create a collage of a forest of real or imaginary animals.


2. **Integrate Mathematics and Science**
   Help learners relate to mathematical functions by integrating them with the scientific topics they are learning. This is a great way to use mathematical reasoning and skills while talking about phenomena that help us in our daily work. For instance, learners can learn about shapes while learning about the solar system – spherical planets and elliptical orbits. They can also learn sizes by comparing the different planets.

3. **Presentations and discussions**
   To incorporate language use in the classroom, learners could present their ideas using charts, graphs, reports of experiments conducted, and so on. In this way, they write about something they have learnt, and also talk about further reading or research in their presentations.




4. Outdoor activities

Planning outdoor activities such as nature walks and trips to supermarkets, museums, planetariums, and so on, can also help learners understand how different disciplines are interlinked. A visit to a supermarket can be a cross-curricular lesson for learners to integrate language skills (reading), science (why some food items are frozen while others are not) and mathematics (addition and percentages on price tags).

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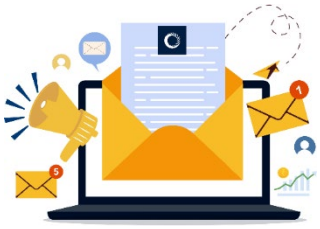

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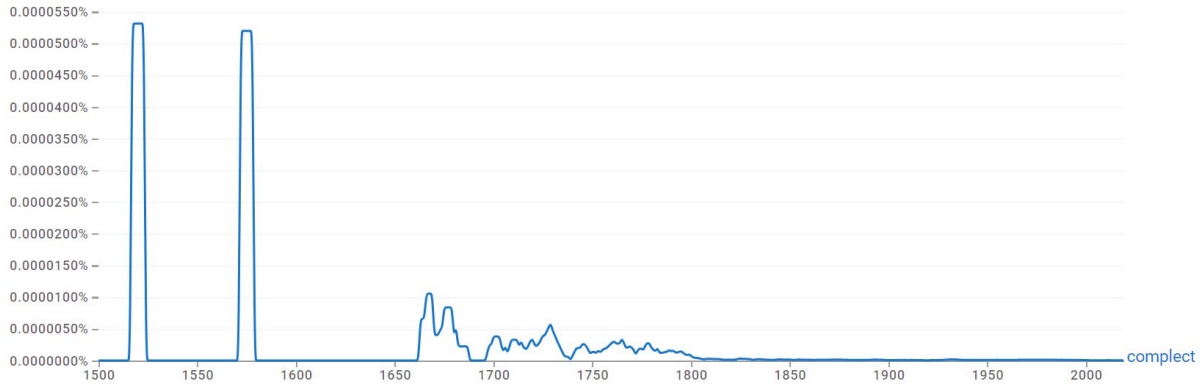
Complect

Pronunciation: [k*uh*m-**plekt**]

Meaning: to interweave; intertwine

Origin and additional information: The word is an obsolete verb form which was used with an object. Currently the word in not in usage in modern English language. Synonyms of *complect* include *interconnect* and *interlink*.

The word originated from the Latin *complectī*, which means 'to embrace' or 'to enfold' or is equivalent to *com-* com- + *plect* (*ere*) 'to plait' or 'to braid' + *-ī* passive infinitive ending; *complex*. The first recorded usage of the word in English was between 1515 and1525.



Source: Google NGram

With the word going into disuse by the 1800s, usage samples of 'complect' are rare to come across. Interestingly, there is a wide usage of its (American) adjectival form, 'complected', whose origin is etymologically from 'complect-', but only this time it means complexion.

Complected is an Americanism, which is almost nonexistent in British English. The word was first used in 1785 and has been used by popular American writers like Mark Twain, O' Henry, William Faulkner, etc.

Usage:

1. Police say that one witness reported possibly seeing a light complected male standing outside of Russell's car.

   (Source: Project Gutenberg)

2. He was a likely-lookin' chap enough, but very dark-complected an' sallow-like, with a bad eye, showin' a lot o' the white.

   (Source: Project Gutenberg)

3. The driver who fled was described as a light-complected black man, between the ages of 18-22, wearing green sweatpants.

   (Source: Project Gutenberg)