04
Active learning strategy

ACTIVE LEARNING STRAGEGY 04

Pluses, Minuses & Interesting Points (PMI)

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THE STRATEGY:

PLUSES, MINUSES & INTERESTING POINTS

Pluses, Minuses and Interesting/Important Points (PMI) is an activity which allows students to share their knowledge and subsequently help qualify their individual understanding of a topic via peer and teacher discussion and feedback. One of the best ways to get students to engage in a class activity is to put them into a situation where they cannot escape without doing and learning something. PMI is a simple, straight-forward and collaborative/social activity that requires a little bit of planning to ensure its success: 'fail to prepare, prepare to fail'.

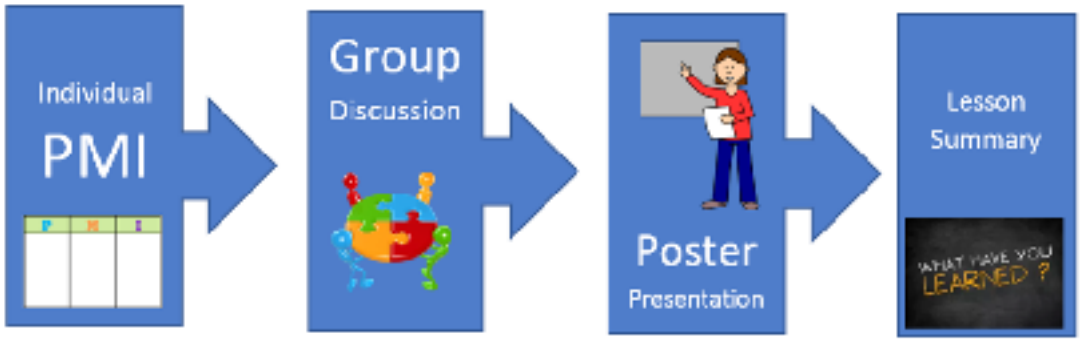
A PMI strategy can be adopted with any of your lecture topics whereby students are afforded an opportunity to ponder a topic individually while recording thoughts and ideas on a PMI sheet.

For the 'I' in PMI you can either use 'Important' Points or 'Interesting' Points. Important Points are more suited to practical applications while Interesting Points are suited to abstract or theoretical topics.

ACTIVITY

INDIVIDUAL PMI

6 minutes are allocated to complete the individual PMI sheet at the beginning of the activity based on 2 minutes for each acronym. During the activity, it is important to encourage students to focus on each specific acronym (P,M,I) for the allocated 2-minute duration. It is important also to a small number of points for each acronym, the output collectively will be much greater once they come together in groups. If more than 2 minutes are allocated to each acronym, some students may become bored which can lead to a lack of focus and cause students to rush through the individual activity.



GROUP COLLABORATION/ DISCUSSION AND PRESENTATION

Having completed the individual PMI activity, students are afforded an opportunity to discuss and contribute to a collective PMI in a small-group setting. To improve time spent on-task and maintain learner focus, it is important that students are made aware of the purpose of the collaboration and that collective group participation is required for successful output.

Groups are invited to present the outcome of their discussion with the whole class group while also affording opportunities for questions and answers. Each group presentation should take no longer than 5 minutes, but this may be reduced if working with larger class sizes.

GROUP SIZES

Ideally group sizes should be limited to 3–4 students as it can be easy for students to become anonymous or some views to be excluded in a larger group setting.

POSTER CREATION/LESSON SUMMARY

Poster creation allows students to summarise key points from a lesson and can result in significant learning particularly when it reinforces newly obtained knowledge.

Affording students an opportunity to display learning in a graphical format encourages creativity while also making the information more relevant and appealing to those with a preference for visual media.

IS THERE A NEED FOR PRE-SESSION ACTIVITY?

This activity would generally require students to complete a task prior to the class activity. This task may be reading a chapter in a book, reviewing a blog post, or looking at a video on the topic. Incorporating a worksheet (Figure 1) as part of the pre-activity task will improve student pre-session engagement and encourage learners to process the information at some level.

Worksheet

Module	Sustainable Technology 2
Subject	Construction
Topic	Airtightness in Buildings
Lesson	No.9
Worksheet	No.9
Directions	The answers to these questions are contained in your notes on Airtightness in Buildings. I recommend that you read the question, find the answer and then write the answer out for each of the following. This will facilitate you to achieve the learning outcomes for the lesson.

1. State 3 reasons why airtightness is important.

1._____

_____

2._____

_____

3._____

Figure 1: Sample worksheet

Although a pre-lesson task can provide more time for student activity during the session, it is not essential. Every student will have some level of knowledge on most topics being studied while the gaps in knowledge can be filled during in-class learning activities and through peer learning.

RESOURCES

PMI: A printed (blank) PMI sheet (see template) for every student.
Discussion: Large sheets (A2) to record group output from PMI discussion (one per group).
Poster: Large sheets of paper for each group of students to create their posters (Size A2 or A3).
One packet of large coloured markers for each student group.
Roll of masking tape/blue tack for hanging up completed posters.

WHAT YOU CAN DO TOMORROW

The PMI strategy can be amended to suit a variety of situations.
The important points to consider are:

1. Frame your question carefully and with intent relevant to the desired learning outcome (think about what it is you want your students to know or learn).
2. Ensure all students formulate an answer to your question. (in writing).
3. Make sure all students share their answers with the rest of the class. (ideally using a method that can be accessed later for reference purposes).
4. Give the students instant feedback and summarise the main points that they have presented(this is so they can all see the value of their contributions and of the overall activity).

Below is an example of how someone could implement this strategy in their lecture tomorrow as an activity facilitated by the lecturer.

CLASS PMI

Present a blank PMI digitally on the screen and pose the question to students in an effort to complete the PMI sheet together. The lecturer leads the discussion and debate, filling the plus, minus and important columns in turn based on student responses. This approach ensures that every student is involved in the creation of the PMI and in discussion when justifying their input.

Topic Sheet For Lateral or Creative Thinking

itb Institute of Technology Blanchardstown Institiúid Teicneolaíochta Baile Bhlainséir

Course	**Energy Efficient Domestic Retrofit Technology**
Module	**Sustainable Technology 2**
Topic	**PMI for Building Materials**
Lesson	**No: 2**
Directions	**Using numbered bullet points list what you think are Pluses, Minuses and Important points about Building Materials, when it comes to the thermal performance of a building.**

Pluses	Minuses	Important Points

Figure 2: Sample worksheet

STEPS FOR IMPLEMENTATION

STEP 01

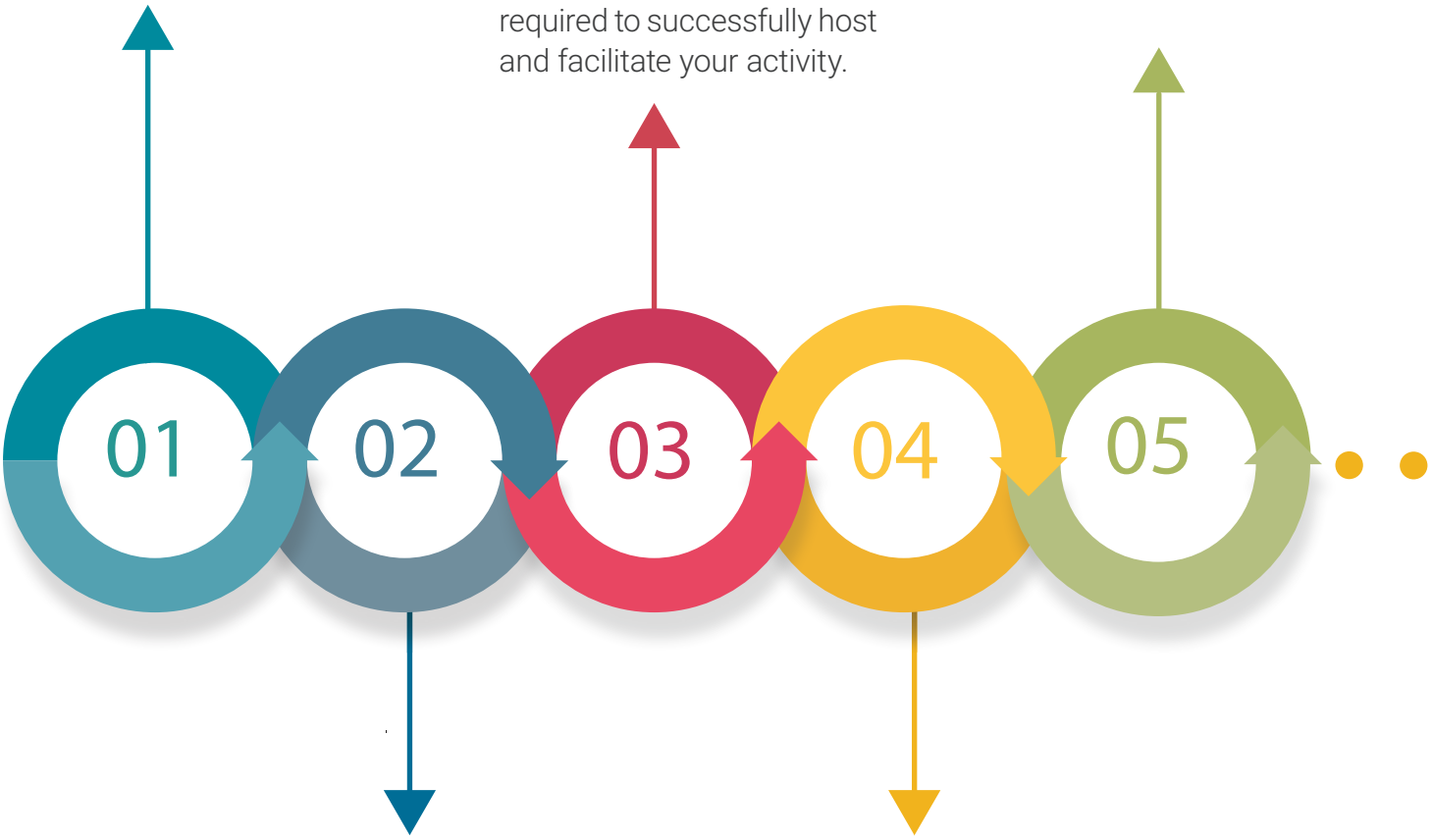
Formulate the question for your specific topic using the PMI template provided.

STEP 03

Gather all the resources required to successfully host and facilitate your activity.

STEP 05

PMI individual thinking activity for 6 minutes (2 minutes each for Plus, Minus and Interesting Point).



STEP 02

(If Required) Provide the student with the pre-workshop task, information and materials including associated workshop sheets

STEP 04

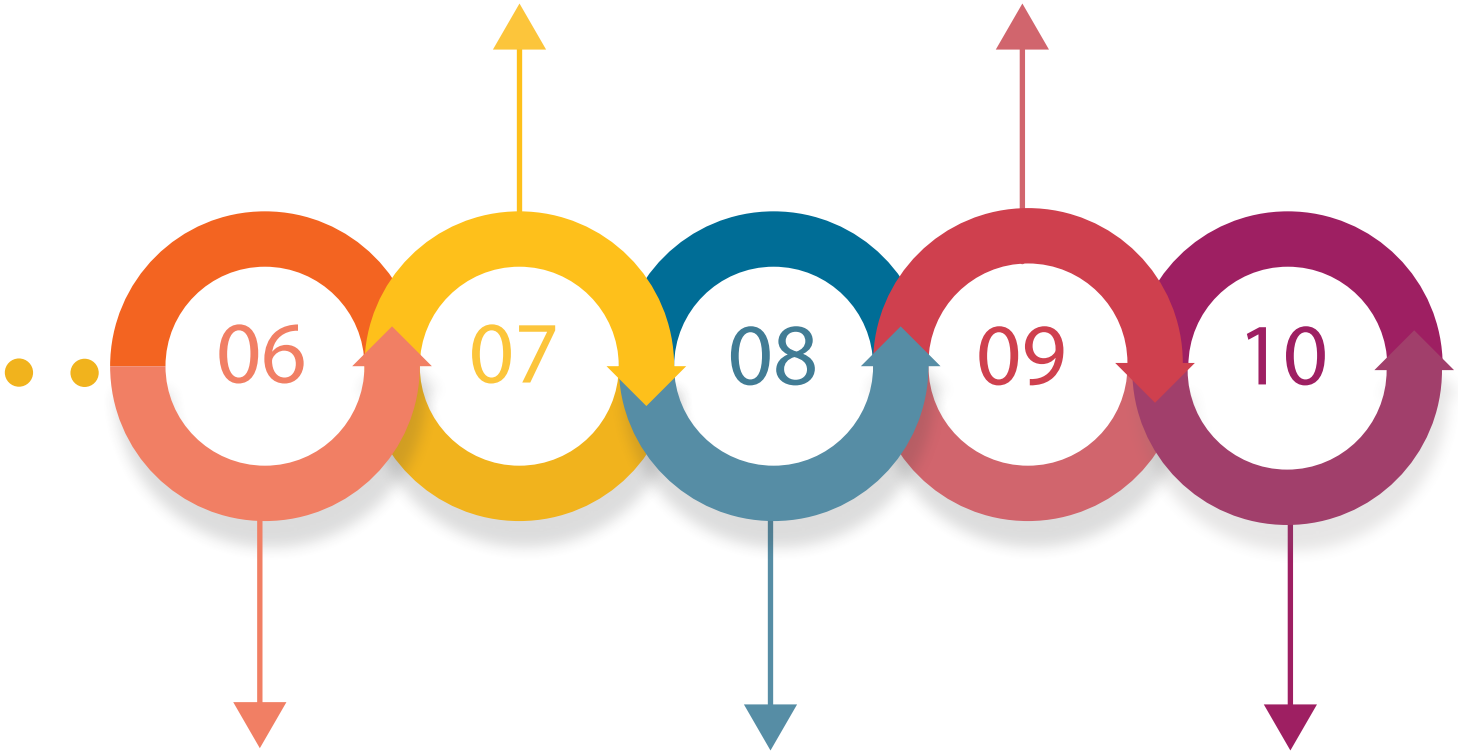
Hand out PMI sheet and explain with particular focus on rationale of PMIs and the workshop schedule.

STEP 09

Questions and comments after each group presentation from the lecturer and/or from other students. This stage allows for the lecture to highlight any misconception and fill any remaining gaps in knowledge.

STEP 07

All posters should be hung up and numbered before any of the presentations begin. Masking tape or blue tack is supplied for hanging up posters.



STEP 06

Group work (split into small groups) to create a collective PMI poster (based on their individual PMI sheets).

STEP 08

Sharing – groups create and deliver poster presentation based on their collective PMI to the rest of the class (5 minutes). NB: students should include their names on their group poster, particularly if being used for assessment..

STEP 10

Summary – synopsis of their posters by the lecturer, highlighting commonality and filling in the gaps. It is also beneficial to highlight the usefulness of this activity at this stage.

OVERCOMING PUSHBACKS

Some of the more common attempts to push back on the use of PMI & Present strategies include:

Why do we have to do this?

(Creating the posters) (Students)

Explain to your students that posters are used extensively at conferences as well as at PhD level as a means of presenting complex material and group presentations are widely used by professionals in industry for planning and solving problems.

Why is your class so disruptive?

(Students, Peers, Management)

Noisy students talk and laugh loudly. This is great once the students maintain their energetic focus on the topic at hand.

Why are some students deciding not to participate?

(Students, Peers)

This happens already in traditional class/ lecture settings. The implementation of this strategy encourages each student to participate in an active way. It is very difficult not to engage in this.

What happens if students do not read/view material (if required) before attending?

(Students, Peers, Management)

Although this happens already in traditional classroom settings, this activity builds on existing knowledge through meaningful discussion with peers who have engaged with pre-workshop material.

CASE STUDY

INTRODUCTION

A PMI is a direct thinking tool designed by Dr Edward De Bono to help focus the mind (De Bono, 1993). It can be used in any situation to elicit thoughts and ideas from a person or group of people on any subject or topic. This activity has been used successfully by the author for a wide variety of disciplines for more than ten years. Below is a descriptive discussion of this activity in action

OVERVIEW

The topic for this lesson and PMI was Roofs, from the module Sustainable Technology 2, a third year module in a BSc in Sustainable Electrical Control Technology at ITB.
The lecture time slot was 2 hours with 40 students. The classroom being used had movable tables and chairs, which was very useful for organising group work. Prior to the lecture (usually 1 week in advance) the students were given a link (on Moodle) to a pre-created 25-minute video on Roofs to view in their own time along with an accompanying worksheet. Students were asked to complete the worksheet and bring it into the lecture.

Worksheet

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Subject	Construction
Topic	Airtightness in Buildings
Lesson	No.9
Worksheet	No.9
Directions	The answers to these questions are contained in your notes on Airtightness in Buildings. I recommend that you read the question, find the answer and then write the answer out for each of the following. This will facilitate you to achieve the learning outcomes for the lesson.

1. State 3 reasons why airtightness is important.

1._____

_____

2._____

_____

3._____

Topic Sheet For Lateral or Creative Thinking

Course	Energy Efficient Domestic Retrofit Technology
Module	Sustainable Technology 2
Topic	PMI for Building Materials
Lesson	No: 2
Directions	Using numbered bullet points list what you think are Pluses, Minuses and Important points about Building Materials, when it comes to the thermal performance of a building.

Pluses	Minuses	Important Points

At the start of the class the students were given a 5-minute overview of the planned timetable for the lecture slot including a rationale for the method being used. Although some students thought the idea of making posters was 'childish', it was explained to them that academics and professionals alike use posters extensively to convey large amounts of complex information and ideas. Students were also made aware that group work is a strategy used extensively in industry for generating ideas and problem solving with outcomes displayed and recorded on white boards and flip charts.

ACTIVITY

Students were given 6 minutes to complete the individual PMI task sheet: 2 minutes for the Pluses, 2 for the Minuses, and 2 for the Important Points. Although some students engaged with the activity immediately, some began talking while others didn't do anything to begin with. However, moving around the classroom, the lecturer encouraged students to work on their own and to write down anything that came to mind as, at this stage, there were no wrong answers. The students were asked to focus only on Pluses, then Minuses, and then Important Points during each of the 2-minute tasks, and they were asked not to move on until the time had elapsed.

Image 1: Group activity students creating their posters

The class was randomly split into groups of 4 (minimum 3, maximum 5) and asked to produce a poster using the sheets and large coloured markers provided. The poster should represent the collective results of the group's individual PMI sheets. 40 minutes were given for the groups to produce their posters. They were encouraged to use references on their posters to give their work credibility. When references were not used during their presentations the students' work was heavily critiqued.

Image 2: Group Posters

After the 40 minutes, all groups were directed to hang up their posters on the walls or white board using masking tape (blue tack can leave marks). Each group was given 5 minutes for presenting inclusive of Q&A from Peers. Strict time management was essential for all of this to run smoothly and for all groups to get an equal amount of time for presenting (no overruns were allowed). After all the presentations were given, the lecturer briefly summarised the topic using quality examples from the different students' posters to emphasise the main learning outcomes from the lesson. A photo of each poster was then taken to be shared with the students on Moodle.

Example lecture slot 2 hours

- 40 students, split into 10 groups of 4
- 10 groups @ 5 min/presentation = 50 min
- 15 min intro including PMI sheet
- Approximately 45 min to work on posters
- 10 min to summarise and take photos

TOP TIPS FOR SUCCESS

With any new activity, the most important thing is to give it a go. Choosing your first topic can be difficult and although you might be tempted to choose an easy topic to begin with, choosing a more difficult one or a topic that either you or your students struggle with can have a surprising or even illuminating result.

Although this activity can be adapted to other learning scenarios, it is recommended to stick to what has been outlined initially. Give the students the freedom to get things wrong and discuss the issues amongst themselves but within the framework provided. The 6-minute individual activity at the start must be done in silence so that the student is given an opportunity to focus the mind. The rest of the activity may be very noisy, so do not feel too bad about demanding silence for the 6 minutes. Let the students know that their presentations will be no longer than 5 minutes and stick to this time limit. Encourage students to convey their message clearly, use sketches if desired, and also to reference posters to add veracity to their work.

FURTHER READING

De Bono, E., 2008. Dr Edward de Bono explains how errors in perception can be avoided through training in his Direct Attention Thinking Tools (DATT). [Online]
Available at: https://www.youtube.com/watch?v=-SGsnZk4kXo
[Accessed 25 October 2018].

De Bono, E., 1993. Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas. s.l.:HarperBusiness.

TEMPLATES

Choose one of your lecture topics and insert the details of it into the template below under "directions" for your students to complete an individual PMI worksheet. Follow the 9 steps outlined in this strategy.

Topic Sheet
For Lateral or
Creative Thinking

Course	
Module	
Topic	
Lesson	No:
Directions	Using numbered bullet points list what you think are Pluses, Minuses and Important points about _____

Pluses	Minuses	Important/Interesting Points