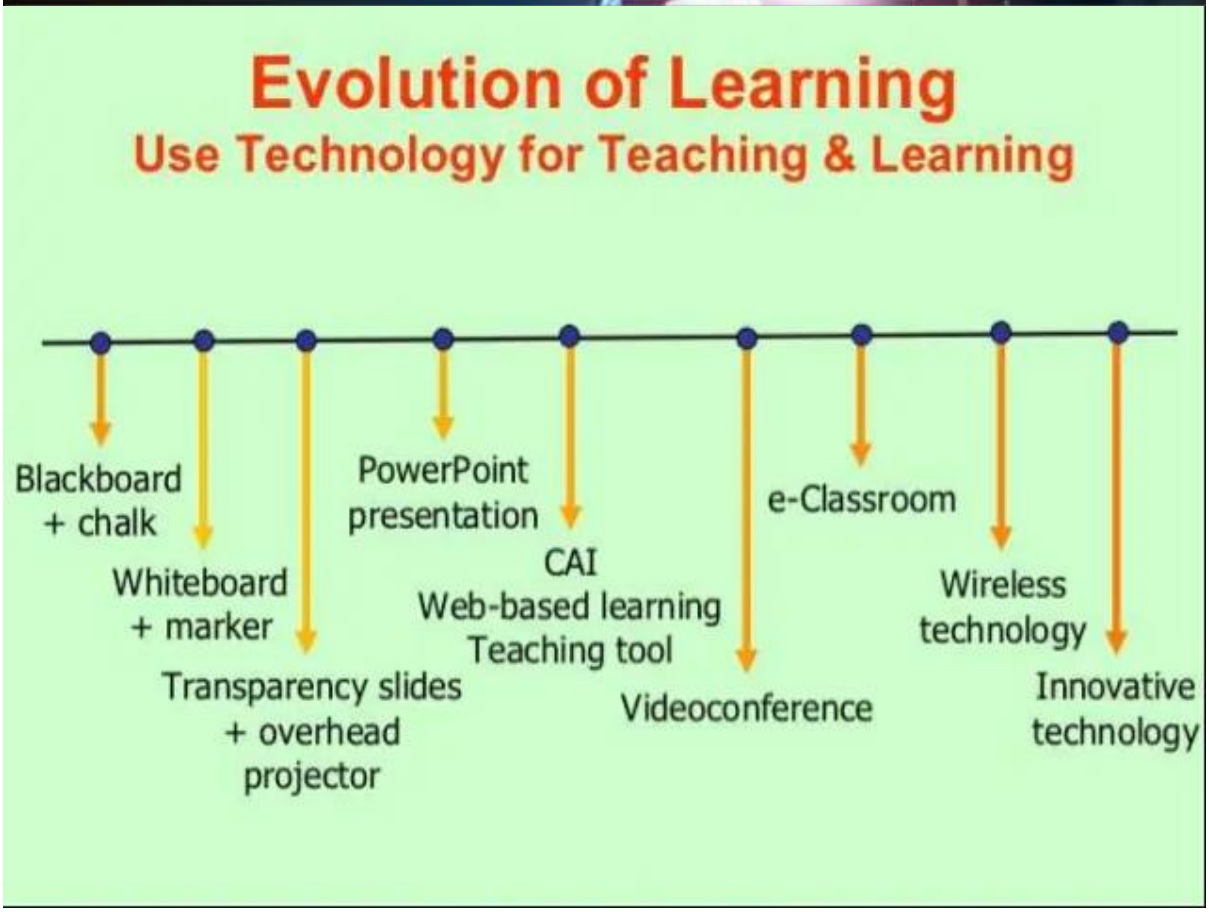
List of Innovative Teaching Methodologies

Recent teaching technology

Education technology is the effective use of technology tools in learning as a concept it concerns an array of tools such as media, machines and networking hardware as well as considering underlying theoretical perspective for their effective application.



We need technology in every classroom and in every student and teacher's hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world.

- David Warlick

Introduction

Advances in technology have had a profound effect on the way we learn & the way we teach.

Many adult learners can remember a time when finding information required travelling to the library to search a card catalog & spending countless hours looking through paper based books & journals.

KEY WORDS

- **Recent – H**appening or beginning not long ago.
- **Teaching** – Something that is taught: the values, ideas and beliefs that are taught by a person.
- **Pedagogy-** It is the method and practice of teaching, especially as an academic subject or theoretical concept.

Teaching technology – It is defined as the study & ethical practice of facilitating learning & improving performances by creating, using & managing appropriate technological processes & resources.

-Richey

or

"Educational technology is the systematic application of scientific knowledge about teaching learning and conditions of learning to improve the efficiency of teaching and learning".

-G.O.H. LEITH

OBJECTIVES OF TEACHING TECHNOLOGY

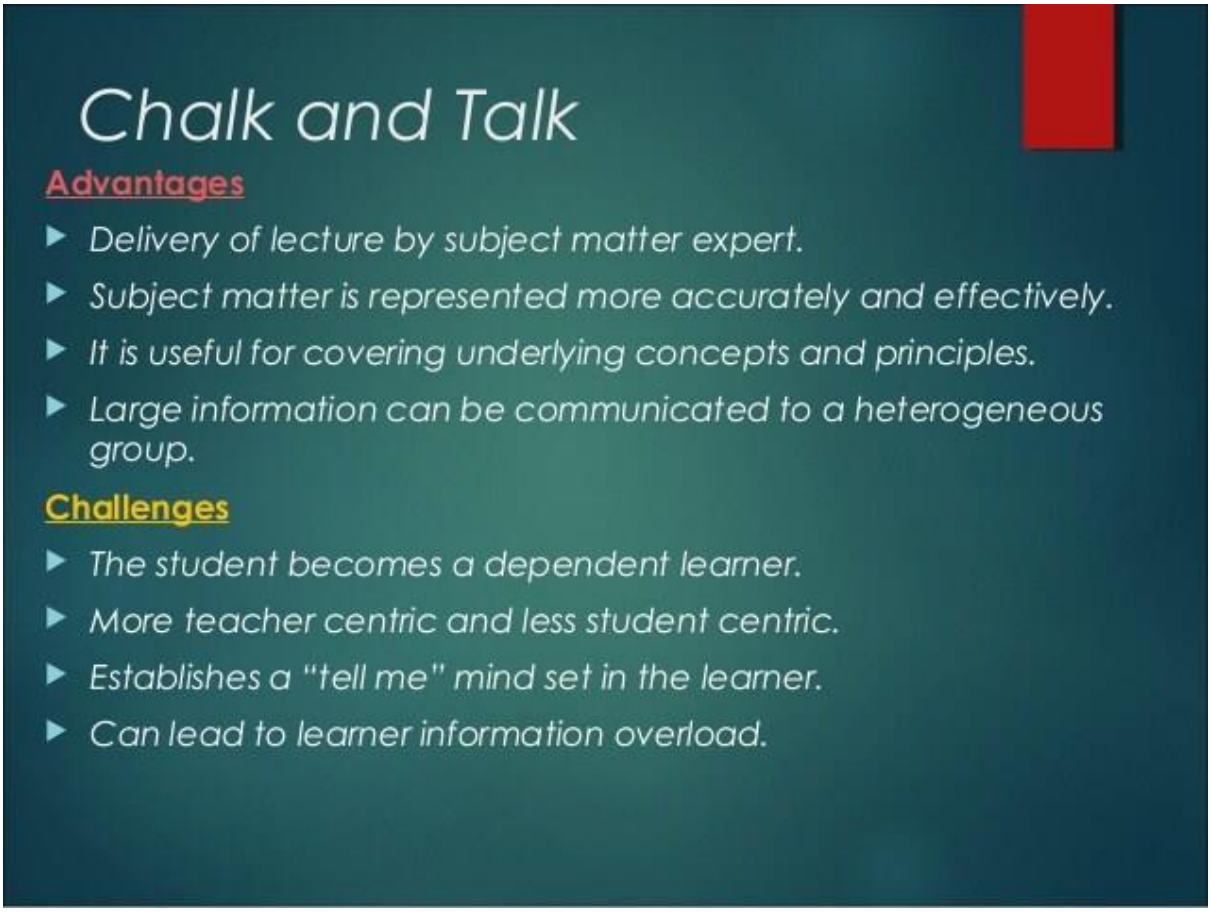
- To determine the goals and formulate the objectives in behavioral terms.
- To analyze the characteristic of the learner.
- To organize the content in logical or psychological sequences.
- To evaluate the learners performances in terms of achieving educational objectives.
- To provide the feedback among other components for the modification of learners.

1.CHALK TALK

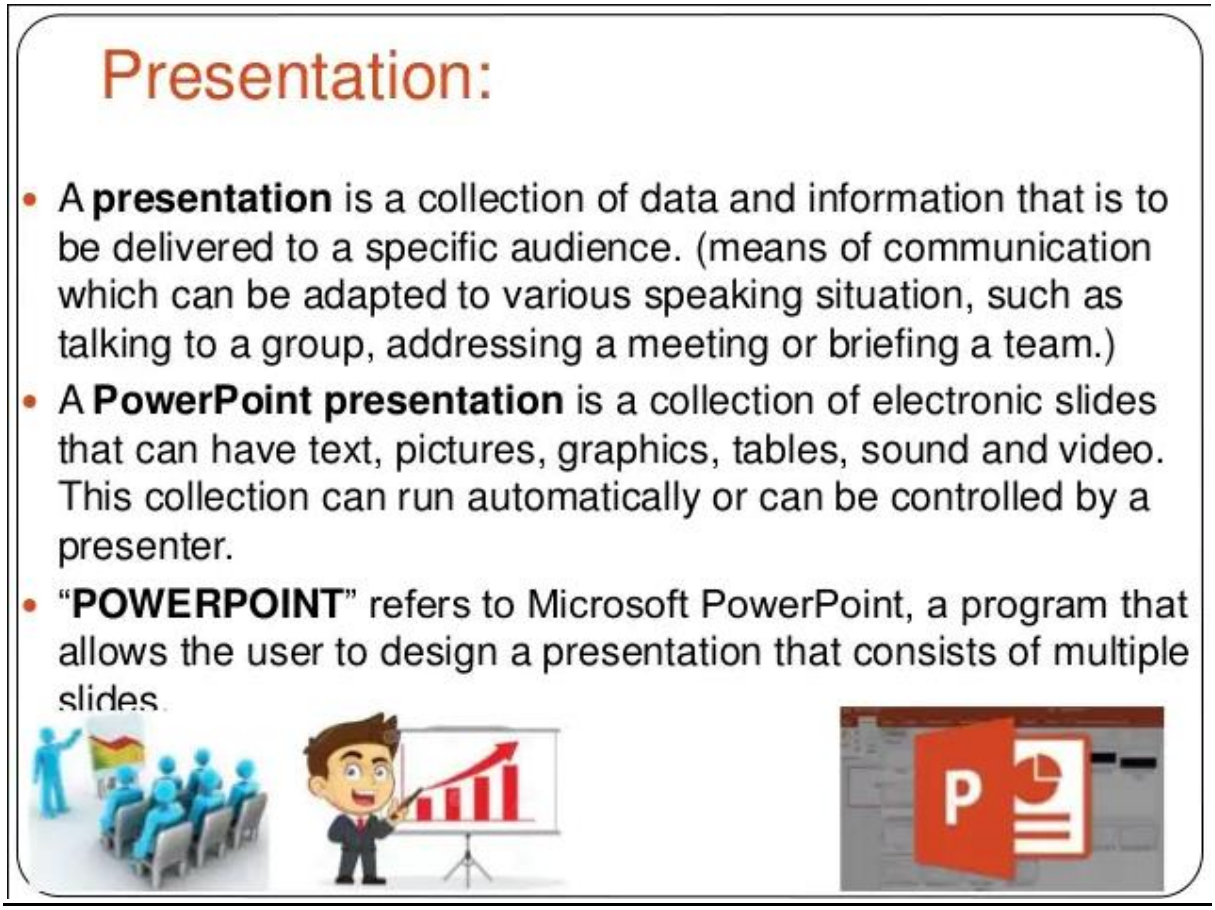
A **chalk talk** is an illustrated performance in which the speaker draws pictures to emphasize lecture points and create a memorable and entertaining experience for listeners. Chalk talks differ from other types of illustrated talks in their use of real-time illustration rather than static images. They achieved great popularity during the late nineteenth and early twentieth centuries, appearing in vaudeville shows, Chautauqua assemblies, religious rallies, and smaller venues. Since their inception, chalk talks have been both a popular form of entertainment and a pedagogical tool.

Early history

One of the earliest chalk talk artists was a prohibition illustrator named Frank Beard (1842-1905).[1][2] Beard was a professional illustrator and editorial cartoonist who published in The Ram's Horn, an interdenominational social gospel magazine.[3] Beard's wife was a Methodist, and when the women of their church asked Beard to draw some pictures as part of an evening of entertainment they were planning, the chalk talk was born.[4] In 1896, Beard published Chalk lessons; or, The black-board in the Sunday school which he dedicated to the Rev. Albert D. Vail "Through whose simple Black-board teaching I was first led to search the Scriptures and my own heart."


Chalk and Talk
Advantages
Delivery of lecture by subject matter expert.
Subject matter is represented more accurately and effectively.
It is useful for covering underlying concepts and principles.
Large information can be communicated to a heterogeneous group.
Challenges
The student becomes a dependent learner.
More teacher centric and less student centric.
Establishes a "tell me" mind set in the learner.
Can lead to learner information overload.

2.POWER POINT PRESENTATION



PowerPoint is the most popular presentation software. It is regarded by many as the most useful and accessible way to create and present visual aids to the audience.

On the other hand, others believe it has created its own mind-set which forces presenters to spend countless hours thinking in PowerPoint and developing slides. A political party has even formed to ban PowerPoint in Switzerland. Depending on one's perspective, it seems that many advantages could easily be viewed as disadvantages.

Look over the list below to see where you stand—with or against PowerPoint.

Advantages

Quick and easy: the basic features are easy to master and can make you appear to be organized, even if you are not.

Simple bullet points: it can reduce complicated messages to simple bullet points. Bullet points are a good basis for a presentation and remind the speaker of main points and the organization of the message.

Easy to create a colorful, attractive design: using the standard templates and themes, you can create something visually appealing,even if you do not have much knowledge of basic graphic design principles .

Easy to modify: when compared to other visual aids such as charts, posters, or objects, it is easy to modify.

Easily re-order presentation: with a simple drag and drop or using key strokes, you can move slides to re-order the presentation.

Finally, PowerPoint is integrated with other products that allow you to include parts of documents, spread sheets, and graphics.

Delivery

Audience Size: PowerPoint slides are generally easier to see by a large audience when projected than other visual aids.

Easy to present: you can easily advance the slides in the presentation one after another with a simple key stroke while still maintaining eye contact with the audience.

No need for Handouts: they look good visually and can be easily read if you have a projector and screen that is large enough for the entire room.

Disadvantages

Design power pointless: gives the illusion of content and coherence, when in fact there is really not much substance or connection between the different points on the slides.

PowerPoint excess: some speakers create presentations so they have slides to present rather than outlining, organizing, and focusing on the message.

Replaces planning and preparation: PowerPoint is a convenient prop for poor speakers, as it can reduce complicated messages to simple bullet points and elevates style over substance.

Oversimplification of topic: the linear nature of PowerPoint forces the presenter to reduce complex subjects to a set of bullet items that are too weak to support decision-making or show the complexity of an issue.

Feature abundance: while the basic features are easy to use and apply, a speaker can get carried away and try to use all the features at once rather than simply supporting a message. Too many flying letters, animations, and sound effects without seeing much original thought or analysis can be a real issue. In many cases, the medium shoves the message aside.

Delivery

Basic equipment required: you will need to have a computer and projection equipment in place to display the slides to the audience.

Focus on medium, not message: Too many people forget that they are making a presentation first and that PowerPoint is just a tool

3.GROUP DISCUSSION

Small-group discussion is a student-centered methodology, that allows students to actively involve and be partners in the teaching-learning process. Students interact with peers and instructors, discussing, and sharing ideas. They develop the ability to build consensus in a group.

Discussion methods are a variety of forums for open-ended, collaborative exchange of ideas among a teacher and students or among students for the purpose of furthering students thinking, learning, problem solving, understanding, or literary appreciation. Participants present multiple points of view, respond to the ideas of others, and reflect on their own ideas in an effort to build their knowledge, understanding, or interpretation of the matter at hand.

Discussions may occur among members of a dyad, small group, or whole class and be teacher-led or student-led. They frequently involve discussion of a written text, though discussion can also focus on a problem, issue, or topic that has its basis in a "text" in the larger sense of the term (e.g., a discipline, the media, a societal norm). Other terms for discussions used for pedagogical purposes are instructional conversations (Tharp & Gallimore, 1988) and substantive conversations (Newmann, 1990).

A defining feature of discussion is that students have considerable agency in the construction of knowledge, understanding, or interpretation. In other words, they have considerable "interpretive authority" for evaluating the plausibility or validity of participants responses.

Prerequisites of a Group Discussion

- Extensive knowledge base related to state, country and globe.
- Areas are politics,sports,science &trade commerce,Industry and Technology,MNC,ect.
- Analyze the social,economical issues logistically .
- Listening skills
- Co-operation.

Definition of Group Discussion

- Group Discussion is a modern method of assessing students personality.
- It is both a technique and an art and a comprehensive tool to judge the worthiness of the student and his appropriateness for the job.

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Group Discussion

- The term suggests a discussion among a group of persons.
- The group will have 8 & 12 members who will express their views freely, frankly in a friendly manner, on a topic of current issue.
- Within a time limit of 20 to 30 minutes,the abilities of the members of the group is measured.

4. TECH TALK

Technology is seamlessly building new avenues of knowledge for mankind. There are a lot of scopes and opportunities to learn new technologies, explore various versions and dimensions of technologies, and implement the practical aspects of technologies thereby improvising on the existing technologies. FCAIT equips its students to build an aptitude for exploring these prospects around technology through its so-called signature activity TECHTALKS.

TechTalks are futuristic technology-oriented talks wherein students explore various upcoming, trending and popular techniques and technologies and present the same to other students through talk shows. These are not regular talk shows but involve students managing the entire show that includes hands-on working and demos of practical concepts as well as seminars of theoretical concepts.

This time owing to the current situation that restricts the physical presence of all, the students of FCAIT have come up with the idea of presenting their TechTalk through a webinar. The TechTalk will also be streamed live on YouTube.

Tech Talks are University-wide events bringing together information technology enthusiasts from across our campuses to share ideas, knowledge, or even a war story or two. They are informal talks, generally held quarterly and intended to be inclusive of an array of IT topics and participation.

Propose a Tech Talk

If you have a topic that may be of interest to the diverse multi-campus UW technical support community, please submit a talk proposal! Past topics have included virtualized computing lab management, web services, and software licensing.

5. GAME-BASED LEARNING (GBL)

Game-based learning (GBL) is the **application of games to learning using tailor-made content or third-party content, all within a gaming environment**. The goal is to engage and motivate learners to acquire new skills, enhance existing ones or change behaviour.

When it comes to engaging and motivating remote learners, traditional learning approaches have their limitations. Game-based learning can foster learner engagement, encourage motivation and deliver a higher return on investment (ROI) for organizations that embrace it.

What Is Game-based Learning?

Game-based learning (GBL) is the application of games to learning using tailor-made content or third-party content, all within a gaming environment. The goal is to engage and motivate learners to acquire new skills, enhance existing ones or change behaviour.

What Are the Benefits of Game-based Learning?

Game-based training benefits organizations across industries as wide-ranging as health care, hospitality, retail, manufacturing and construction. Its benefits apply equally to commercial, industrial and government sectors.

Because of its unique approach to training (learning through playing and having fun), GBL appeals to employees across the generational spectrum. Unlike the typical entertainment value that games provide, when used in a learning context, games:

- Encourage strategic thinking.
- Provide an opportunity for practice.
- Enhance motivation among disengaged learners.
- Promote healthy competition.
- Improve self-directed learning and independent thinking.
- Foster collaboration.
- Create a safe environment for learning through experimentation and trial and error.
- Help develop a spirit of patience and persistence among learners.

Game-based learning is ideally suited for repackaging existing eLearning content in ways that not only lead to improved learner engagement but also support critical thinking. For example, health care entities might adapt their health and safety protocols to a game-based learning environment, while industrial organizations may benefit from training employees on good manufacturing practices (GMPs) using game-based scenarios. Given that mobile learning is a trend, it makes sense to include game-based learning strategies as part of any organization's learning and development (L&D) plans.

Have you heard of **game based learning in education**? Being a school, did the availability (or non-availability) of **game-based learning** apps ever mattered to you?

In case you don't know what **game based learning activities** are and how they can be of help to the students, here is something you can read and consider.

What human being sees, experience, perceive, and does during the young age, impact his/her life decisions to a great extent. Most of our time during the young age is spent in schools, and hence, schools play an essential role in a person's mental, social, and

physical development. What human beings learn during this period of time stays with them for an extended period of time.

Therefore, schools have a strong reason to make honest efforts to cater to students with **positive and healthy learning experiences**.

Considering the present market scenario, the competitive world environment, technological advancement, and the demand for quality-driven work, schools have to uplift the way they teach students. **Game-based learning** is one of the trusted and trending ways schools and educational institutions have adopted to make sure that they contribute to society by providing it with the best possible talent.

What Is Game Based Learning (GBL)?

This concept is not new to us.

For centuries, human beings have used fun activities and games to help students understand things better. The basic intention behind the concept of Kindergarten is to teach children through games and play.

It is psychologically proven that children learn better and faster if the lessons are taught through practical examples, games, and activities, especially when we think of **STEM learning.**

The introduction of **video games** to the consolidated learning experience was undertaken based on the same fact. In video games, players start with the basic, complete each assigned task, and then ushered to the next level. By the time students reach the last level, they are ready to face the challenges of that scale.

However, saying something is not enough; things need to be implemented too.

Here are a few ways for schools to **integrate game based learning** and motivation into the classroom:

1. Know 'WHY' before introducing Game-Based Learning to your school:

Don't do something just because it is a trend or other schools in the vicinity are doing it. It is not about others; it is about your learning methods and your students. Once you decide the purpose behind using **game-based learning**.

In case a student is unable to understand a few concepts, GBL can be used to understand and overcome the trouble spots. The **game based learning** activities you chose to overcome the trouble points have to be such that they cooperate with player's (student) knowledge and learning style.

In case your students are able to understand the core concepts well, then it is time to raise the bar and strive to provide an **enriched learning experience**. You can now challenge the students by moulding the same core material content through different mediums like videos, images, etc.

There are multiple ways of integrating **game based learning** activities in traditional teaching methods. Knowing the purpose makes it easier for both teachers and students to carry the tasks.

2. Test it yourself first:

Before you go ahead and introduce your students to the GBL apps, it is recommended to test them yourself first.

Check if the game is appropriate for your students and if it is in line with the purpose.

Make sure the teachers stay in charge of the GBL activities, the activities are easy to understand, its engagement value is more, and the teachers can help students perform these activities.

3. Parents' consent matters:

If the parents provide their consent with the GBL in education, you can expect their participation and support too. Students will be able to perform better if they find support both in school and at home.

4. Use it Wisely:

Having **game-based learning** sessions in between the regular teaching sessions to support the latter will build interest in the student's mind about the subject. Teachers can use GBL apps as a springboard to land students in a mental space where they are ready to understand the topic.

Or

Mentors can do it the other way around too. They can use **game based learning** to check what students have understood.

There are some **game based learning benefits** to the students, too:

Smart or **digitized game based learning experiences** help improve the learning capabilities of students. Students learn at their own pace. Improve their interpretation skills, etc.

Incorporating this new method of learning to the **traditional learning methods** would help to deliver a **positive learning experience** to the students

6.FIELD VISITS/ INDUSTRIAL VISITS

The term “field trip” has been known for decades in many sectors and it is a common term used in worldwide schools. It seems that a field trip is a favorite part of both teachers and students who are keen on learning and discovering. So, what is a field trip in education? Scroll down to find out the field trip definition and its many types.

Educational Field Trip Definition

A field trip or excursion is a journey taken by a group of people to a place away from their usual environment. In education, field trips are defined as visits to an outside area of the normal classroom and made by a teacher and students for purposes of firsthand observation. A field trip can be expressed in many terminologies. People call educational trips or school tours in the UK and New Zealand, and school tours in the Philippines. Field trips are a popular method carried out for students to introduce to the concepts, experiences, and ideas that cannot be given in a classroom environment. School tours can be considered as short-term learning activities providing students the opportunity to observe their chosen subject outside of a classroom setting. Exploring other cultures and customs, getting to the motherland of languages, uncovering pristine nature and experiencing fascinating local life are striking demonstrations of educational school trips

Types of Field Trips

Those listed field trip ideas that help to clear field trip meaning. Efficient educational tours can spark students’ imagination, give them valuable experiences and refresh their minds after days with pencils and papers. A school tour can be themed with one type of field trip or combined by various school trip ideas.

Sightseeing Field Trip

Students are definitely eager the most to sightseeing school trips enchanting them by a myriad of appealing attractions in their wish destination. Admire well-known attractions, explore historic structures, discover World Heritage Sites, unwind on spectacular landscapes and freshen in front of scenic vista are incredible activities that gain huge interests from students and strongly inspire them.

Language and Culture Educational Field Trip

For students learning foreign languages, field trips are very important and helpful to improve the language and explore the alluring indigenous culture. Join immersive activities, stay at a local homestay, take language lessons and visit local markets enable students to practice the language, get a deeper understanding of local culture and their captivating paces of life

Gardening and Farming Field Trip

This might be an interesting activity attracts lots of students' attention thanks to its strangeness to their usual life. Discover specialty farms that grow the normal crop and even irregular crops will surprise curious students. Learn how vegetables are produced, explore and give a try to do traditional farming techniques of local people leaves memorable experiences for students.

Manufacturing Facility Field Trip

Students can be guided to any factory where equipment, cars, tools, packaging or any other things are made. The mechanized facilities and assembly lines are interesting for students to learn about the production process, how raw materials are utilized and how workers use them to make the final product.

Eco-adventure Field Trip

Discover the natural world is a highly important perspective in the educational sector. Students can be entertained and refreshed by trekking through untouched natural beauties to inspect local plant life and wildlife animals. This opportunity also adds to local historical factors such as early life remnants.

Business Educational Tour

Take business study trips, your students will be delighted by bustling financial and business centers. Business study trips help process business theories in the classroom into life as students explore great commercial organizations. Business field trip gives students the chance to immerse in stimulating and dynamic environments. Visit a range of famed organizations and large corporations will perfect business school trips.

INDUSTRIAL VISIT

Why are Industrial Visits Important?

Industrial visits! The term itself instils immense happiness and excitement in students. The idea of embarking on an educational trip encourages many. However, for some, this excitement is soon killed when they are not allowed to go for the industrial visit. Because of monetary and family reasons, students often avoid these visits. It is high time that you realise the importance of these visits and take them as an opportunity to learn about your dream career.

Industrial visits offer a great source to gain practical knowledge. Students can observe and learn as to how theatrical concepts are put to into action, thereby aiding their practical learning. Students are exposed to real working environment and shown how things are done in an organisation. From the details about the management to the targets they achieve, everything is covered in these visits.

Industrial visits are a complete package which aims at widening the knowledge of students. It is not just an outing organised by school/college authorities for fun. These visits are related to your curriculum, so you get to learn things which are beneficial to you in the future. They are totally educational in nature with rich learning experience.

Industrial visits generate an excitement among students as they get a chance to learn something outside the confines of their school/college walls. Thus, it adds to a source of entertainment as well.

An industrial visit is your first-hand experience to anything related to your career. It helps you gain an active learning experience. Schools and colleges cannot afford to show you the real methodologies of companies. Therefore, industrial visits are a great way to gain as much as practical and technical knowledge on your area of interest. Be it challenges involved in a particular area of interest or nuances to master the field or scope, everything is covered in an industrial visit.

The gap between theoretical learning and practical exposure is actually bridged by industrial visits. The importance of industrial visits is such that it has been made mandatory in many institutions.

Also, students are always curious about what kind of work they would be doing after entering their favourite industry. Through industrial visits, they can clarify their doubts and silence their curiosities. They can communicate with people and organisations to get a clear idea of their dream job

TEACHINGLEARNINGPROCESS

Akemi Business School adopts various student centric teaching learning methods for enriching learning experience. The student centric method includes experiential learning, participative learning, problem solving methodologies etc. all the essential facilities are provided to staff to enhance the development of students. The list of other contemporary methods includes online certifications, language lab, ICT enabled teaching, Case study etc. The institute's continuous efforts related with experimental learning, participative learning and problem-solving methodologies are summarized below:

1)ExperientialLearning:

- An industrial visit and field visits are organized every year to help students connect theory with practical education.
- Excel Lab sessions are conducted to learn about representation of pie charts, graphs etc. Students use these representations techniques during data analysis and interpretation in their summer internship project.
- Students undertake dissertation & summer internship project work to understand the contemporary issues in management. This leads them to mining data from different sources and approaches to the issue at hand.

2) Participative Learning: Akemi Business School uses Participative Learning to encourage students to actively involved in learning process. The Institute uses many methods for participative learning like a few given below:

- Group Discussions
- Role Plays
- Class Room Presentations
- Small Group Exercises
- Assignments
- Team Building Exercises
- Management Games
- Participation in Inter-Institute Competitions
- Participation in various committees and cells for organizing various events like seminar conferences
- Planning, Participation and execution of annual social gathering
- Workshops are organized by the institution to exhibit technical skills of students.

3) Problem Solving Methodologies: Catering to 21st Century Skills like Critical Thinking, Creativity and Problem-solving skills required by the corporate world, many activities are undertaken to acquaint the students with real issues of businesses. Student should learn to identify problems and use innovative thinking to solve problems faced by the business organizations. Such activities include - Case Analysis and Discussions, Research Projects etc.

4) ICT Enabled Teaching Learning: Akemi Business School use a diverse set of ICT tools to create, communicate, circulate, store and manage information. In some contexts, ICT has also become integral to the teaching-learning interaction, through approaches as replacing chalkboards with interactive digital whiteboards, using teachers' own smartphones, laptop or other devices for learning during class time. These approaches can lead to progressive thinking skills, provide creative and individualized options for students to express their understandings and leave students better prepared to deal with ongoing technological change in society and workplace.

7.ASSIGHMENTS

The Assignment methodis the **most common method of teaching especially in teaching** of Science. It is a technique which can be usually used in teaching and learning process. It is an instructional technique comprises the guided information, self learning, writing skills and report preparation among the learners.

Assignments are the tasks given to students by their teachers and tutors to complete in a defined time. They can also be referred to as the work given to someone as a part of learning. Assignments can be in the form of written, practical, art or fieldwork or even online. Their purpose is to ensure that students understand the subject matter thoroughly.

Generally, students are assigned a task as a part of their homework. The allocation of assignments is not only restricted to a class or subject, but this method can be applied at any stage of life. They are a great way to judge the ability and understanding of an individual towards a subject matter.

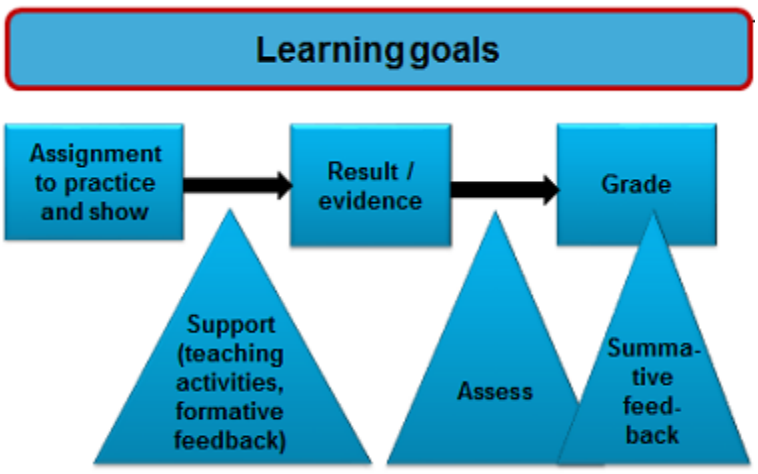
The culture of providing homework starts from kindergarten in various forms. Small children are asked to read and write what they learn in the class. Students in the higher class are given work as a part of their revision exercise and help them prepare for exams. Individuals doing honours write journals as a part of an assignment that determines their knowledge in that subject.

The structure of assignments depends upon the nature of the task and subject. They must be well-researched, include case-studies or examples within a proper framework. These studies are useful for students to achieve the desired examination results. It also helps them to concentrate better on education. Assignments help teachers assess students better.

Since assignments are deadline-based, they help students take responsibility and manage time. The work assigned to students may be individual or group activities, or both, to develop teamwork in them.

What to consider when using assignments as an assessment method for a course?

An assignment is a piece of (academic) work or task. It provides opportunity for students to learn, practice and demonstrate they have achieved the learning goals. It provides the evidence for the teacher that the students have achieved the goals. The output can be judged using sensory perception (observing, reading, tasting etc.). The assignment can focus on a product as output (e.g. research report, design, prototype, etc.) and/or a process (e.g. research process, group process) and/or the performance of individual skills or competences (e.g. professional skills, communications skills).



There are a lot of benefits to gain from using an assignment as an assessment method. Assignments can for instance be used to test higher cognitive abilities and the application of specific skills or knowledge. It can mirror the future professional practice. It can be used to assess the integration of knowledge, skills and attitudes (competences).
When designing and using an assignment as a summative test (students get a score or grade or pass/fail judgment), there are things to consider: will it be an individual assignment or group assignment; just one assignment or more; how to make it motivating and challenging; will I provide interim feedback etc.? There are also issues to consider for assessing the final results. Like: how to assess in a reliable, objective, consistent way; what are the criteria to be used; how to weight different elements of the assignment; how to calculate the grades based on the scores; how to avoid or check for free-riding or plagiarism etc.

When assessing with assignments, we should pay attention to:

>> ***validity***: we really test what we want to test; the assignment and the way we assess the results are aligned with the learning goals.

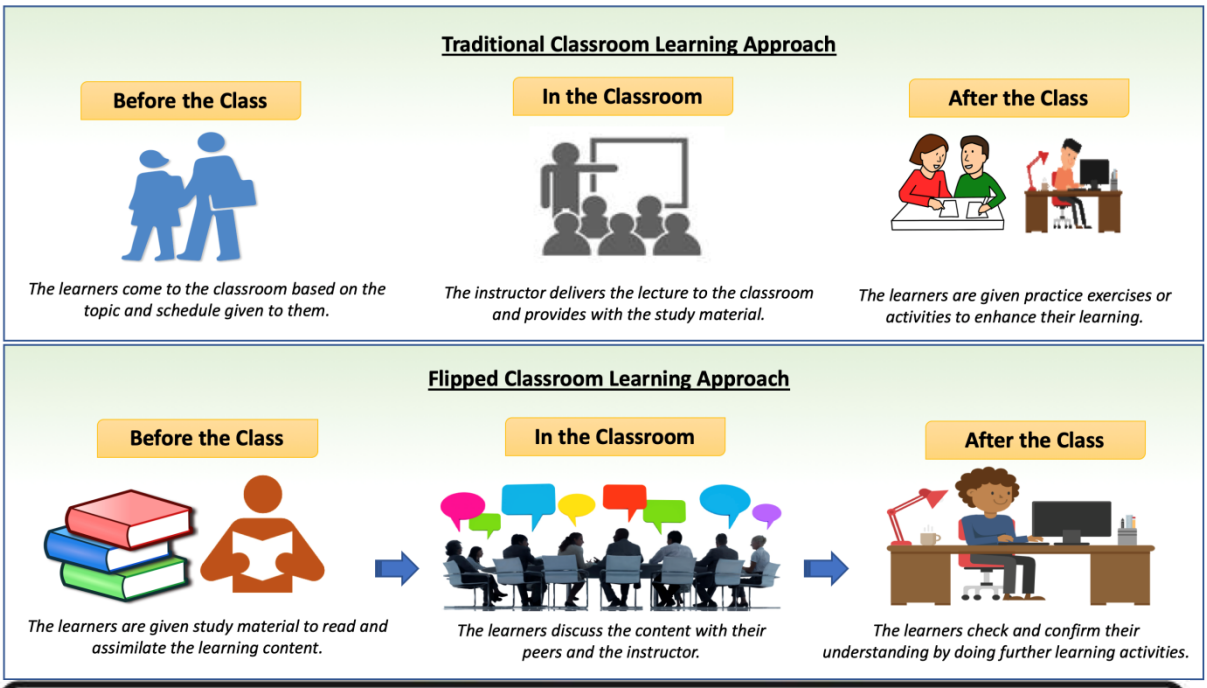
>> ***reliability***: based on the results, we make a right, just, fair, objective distinction between pass/fail or provide the just grade. Our scoring or grading is done in a consistent way and the judgments or the grades are meaningful.

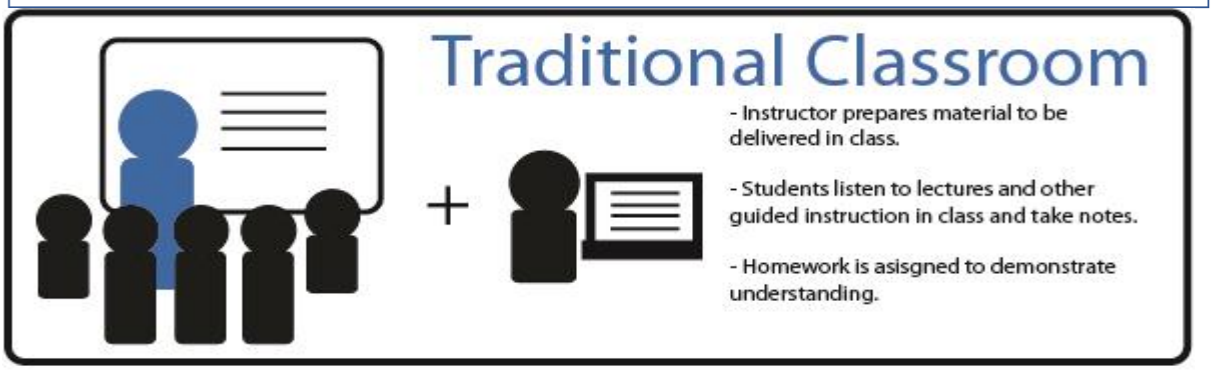
>> ***transparency***: it clear upfront for the students what they will learn, what they have to do (as evidence; what to deliver or show), how they will be assessed and what to expect during the process.

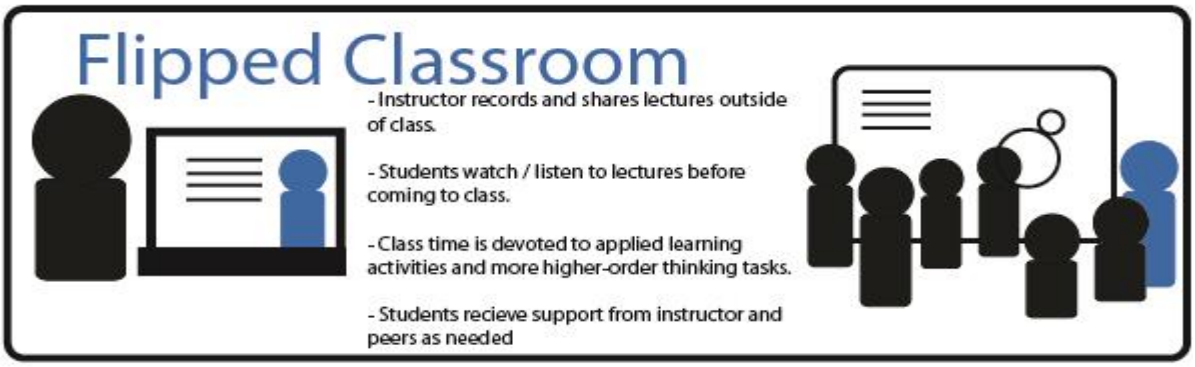
>> the assignment and the feedback provided will ***support the learning process***.

With the toolbox below, related to the questions and issues mentioned above, we hope to offer you useful tips and guidelines for designing and assessing assignments.

8.FLIPPED CLASS ROOMS



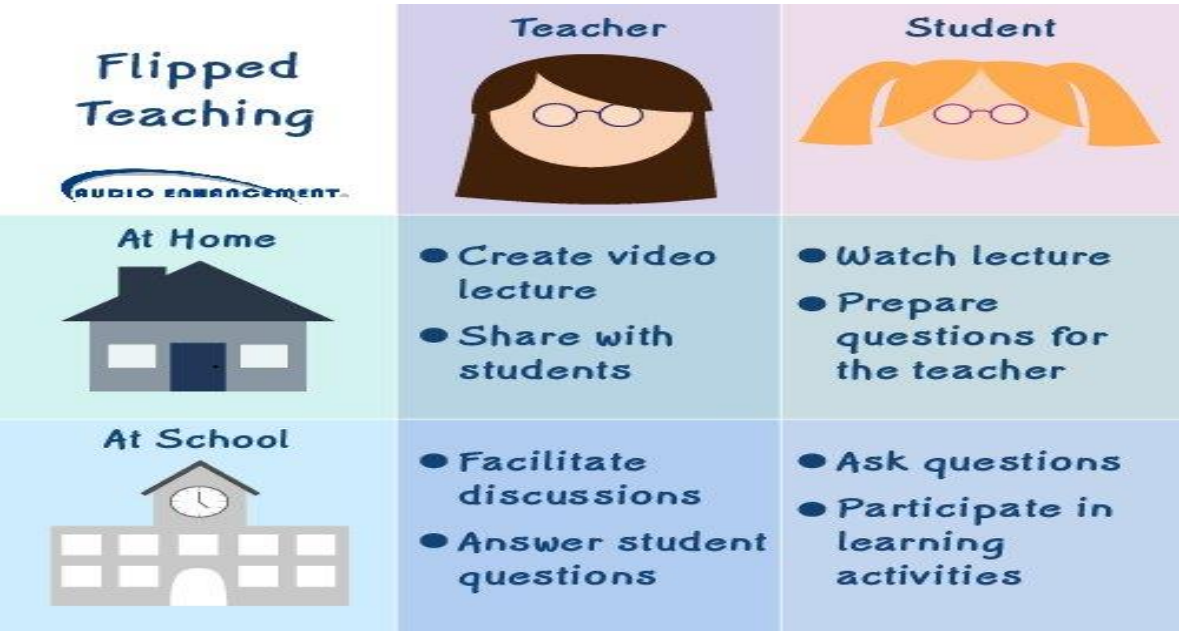




Flipped Teaching: What is it?

The flipped teaching method has been around for more than a decade and continues to be a practical first step to shift from a traditional classroom to a blended learning model. Flipped teaching reverses, or "flips", the traditional take on in-class lectures and homework. Students watch the teacher's prerecorded lecture at home, and in-class time is used for students to test skills, apply knowledge, and interact through hands-on projects, discussions, and exercises.

Steps to flip your classroom



At home:

- Teacher provides lecture material to students
  Turn your lecture into an online video recording and make it accessible to your students. Record and upload your lecture easily using VIEWpath. With the VIEWpath software, teachers can easily share their lessons, making it easy for their students to access the lesson at home.

- Students prepare for in-class activities and discussions
  Students are able to watch the lecture, learn at their own pace, replay parts they didn't understand, and prepare questions for the teacher.
  In class:

- Teacher prepares adequate lesson work and discussion
  Since the students already watched the lecture and are more familiar with the material, in-class time is used for projects, exercises, and discussions to further understanding. It is important to answer questions regarding the lecture.

- Students reach new levels of mastery

  Students are able to learn more effectively, learning at home and having the teacher available to answer any questions on either the lecture or the lesson work. Flipped teaching means more time with the teacher and more exposure to class material.

  While flipped learning is not a new concept to education, it remains an effective way to transition from a traditional classroom to a facilitative learning environment. When implementing a flipped classroom, 71% of teachers indicated that student grades improved, and 9 out of 10 teachers noticed a positive change in student engagement. Using the flipped learning method, teacher interaction with students becomes more personalized, with more guidance and instruction than just traditional lecturing.

9.QUIZ

A quiz is **a quick and informal assessment of student knowledge**. Quizzes are often used in North American higher education environments to briefly test a students' level of comprehension regarding course material, providing teachers with insights into student progress and any existing knowledge gaps.

quiz refers to a short test of knowledge, typically around 10 questions in length, with question formats often including multiple choice, fill in the blanks, true or false and short answer. A quiz is much shorter than a traditional test or exam and is rarely impactful on a final course grade. Professors who employ quizzes in their courses—a practice which is increasingly viable thanks to the broader use of technology in higher ed—may schedule them in each class to ensure students have retained knowledge from the previous lesson. Others may hold pop quizzes, which are surprise tests geared towards making sure students have read course materials and are understanding broader course learning's.

A quiz refers to a fast and information evaluation of the knowledge of students. Teachers often give a quiz within a learning environment to assess how the learners understand a concept. Therefore, it serves as a process to understand students' insight into the subject matter. In the process, the teachers can detect any possible knowledge gaps.

In general, a quiz tests the knowledge of the students or learners in a class in a short period. The questionnaire usually consists of around ten questions. The format of the quiz may vary. It might include MCQs, fill in the blanks, short answers, and true or false. Compared to traditional exams, they are much shorter.A quiz is one of the oldest methods to test the academic knowledge of students. Globally, in higher education, educators are using sophisticated technologies, which makes it easier to deploy quizzes. At times, teachers use these strategies to test knowledge in examinations as well. Educators sometimes use a quiz to ensure that the learners have successfully retained knowledge from the previous classes. At times, teachers organise pop quizzes. These are more like surprise tests, formulated to ensure that students are well-versed with their study materials. In the process, they get a broader understanding of the materials that the trainers provide.

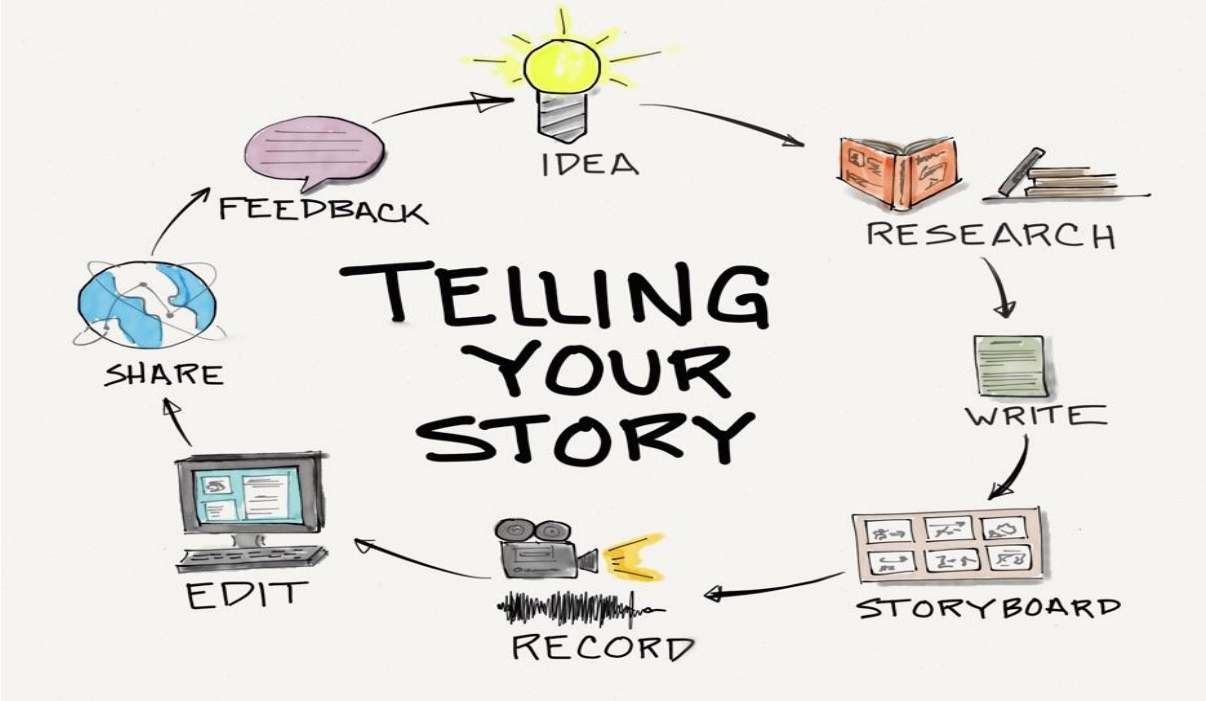
In virtual classrooms, online quizzes may be taken by teachers. The assessment process of results in such quizzes is comparatively easier than offline quizzes.

1. Use quizzes frequently as part of your teaching techniques

Weekly—or even daily—quizzing helps students put what they've learned into practice. This practical repetition drives home important facts so that students are prepared to take on higher-stakes exams like standardized tests and final exams. Frequent quizzing also takes the edge off these stressful evaluations.

Consider having your students complete online quizzes that test the students' understanding of the subjects you're covering in class. These quizzes, which can be as short and informal as you'd like, encourage students to pay attention in class while helping you gauge the level of learning in real time.

10.STORY BOAT



The world is full of things to learn about. We live in an age where accessing information is much easier and learning opportunities are ripe. One of the newcomers to the world of sharing information is eLearning. The technology has opened up many doors for traditional educators but also new players in the sector. When it comes to eLearning, the content naturally plays a key role. It's crucial to spend a lot of time thinking what the best ways to get the message across are. For this purpose, storyboards are magnificent and can enhance the eLearning experience, for both the students and the teacher. So, if you want to boost your courses, here are 8 tips that'll help you create storyboards for effective eLearning. But first, it's a good idea to glance at the concept of a storyboard.

What's The Purpose Of A Storyboard?

If you want your storyboard to be effective, it helps to know what it is supposed to do and how it is meant to perform.

Simply put, a storyboard is a visual representation of how your teaching experience will unfold – step-by-step. It usually consists of a number of squares or circles that illustrate the different elements. It should have images and notes explaining what should happen at any particular moment. It's essentially a short description and representation of all the steps you need to go through at any given moment.

8 Storyboard Tips For Effective eLearning

Storyboards are not inherently difficult. As the description above shows, the concept is not difficult to grasp. However, executing a good storyboard can be difficult – what information should you include and what to leave out?

So, let's look at the 8 tips that will guarantee to help you create a good storyboard in no time.

1. Know What You Want To Achieve

Even before you begin working on the storyboard, you need to consider what you want to achieve with the eLearning. What is the purpose of the lesson or the course? Outline the outcomes that your students should obtain by the end of the eLearning experience. If you know what your objective, it's much easier to focus on the right content. Understanding of

Content Marketing strategies is really foremost to go further which can help you to best place your storyboards.

One interesting point is to also consider the role of social media in your eLearning course. It can actually sit well with your existing strategy and you could use similar structuring options as part of your storyboard as well.

2. Have All Of Your Content Ready

Make sure you have all the course materials in front of you and already seleected before you begin creating a storyboard. You can't create an effective experience if you keep adding things to your eLearning lessons in the middle of it all. Always have the material ready and have an overall idea of what you would want to use. It is possible to remove certain elements as you are building the storyboard, but you don't ever want to have to do this once you are essentially already finished.

3. Break The Goal Into Smaller Objectives

You have already set the main objective for your course but you also need to think the smaller objectives that work towards this main goal. Whether it is by lessons or indeed by the hour – you need to have smaller learning objectives set. A good way to incorporate these into your storyboard is by ensuring each slide or square in your storyboard has its own objective. Each action, task, reading, and so on should have a meaning – something that pushes towards the main objective.

4. Measure Your Students

The storyboard should also focus on assessing your students. What are the things that tell you the students are learning? You should incorporate the different assessment criteria to your storyboard and ensure it includes plenty of pauses for measuring how well your students are doing.

5. Use Different Elements As Part Of Your Storyboard

To enhance learning, the lessons must be engaging in different levels. Everyone learns a bit differently and therefore, you need to ensure the process isn't narrow and focused on just one method. Make sure your storyboard actively uses different design elements that support different ways of learning. Include videos, add interactions, utilize quizzes and play with text and images.

6. Find A Proper Storyboard Template

You don't have to create a storyboard from scratch. Indeed, it can save a lot of time and money to opt for a template and to customize it according to your needs. You can find template ideas online and pick one that best matches your objective.

7. Finalize With An Authoring Tool

Aside from using a template, you might also want to add an authoring tool to your storyboard. This will help to streamline all the different components and ensure the elements stick together to create a coherent learning experience. There are plenty of options out there from Ubuntu to Articulate Storyline. The key is to conduct a bit of research before you get pick your favorite. When you are analyzing the different tools, you want to focus on things such as the type of content you are going to include in the storyboard, the timeline you are utilizing and the kind of budget you are working with. It is possible to find cheap authoring tools online but you do have to keep your eyes open and look around a little. Always look for software vouchers before you buy an authoring tool.

8. Test Your Storyboard

Don't just create a storyboard and then use it with your students. For the most effective experience, it's always best to test it out on a few students or your friends and family. Listen to the feedback and assess how you felt the storyboard performed. Don't be afraid to tweak it – it's possible that your first attempts won't work but if you keep exploring you will find the methods that best work for you and your students.

Creating storyboards for effective eLearning is not rocket science, but it will take some effort. If you keep the above tips in mind, you are sure to succeed.

11.CASE STUDIES

Case studies is an instructional method (not a theory) that refers **to assigned scenarios based on situations in which students observe, analyze, record, implement, conclude, summarize, or recommend**. Case studies are created and used as a tool for analysis and discussion.

To prepare students for jobs that haven't been created yet, we need to teach them how to be great problem solvers so that they'll be ready for anything. One way to do this is by teaching content and skills using real-world case studies, a learning model that's focused on reflection during the problem-solving process. It's similar to project-based learning, but PBL is more focused on students creating a product.

Case studies have been used for years by businesses, law and medical schools, physicians on rounds, and artists critiquing work. Like other forms of problem-based learning, case studies can be accessible for every age group, both in one subject and in interdisciplinary work.

You can get started with case studies by tackling relatable questions like these with your students:

1. How can we limit food waste in the cafeteria?

2. How can we get our school to recycle and compost waste? (Or, if you want to be more complex, how can our school reduce its carbon footprint?)

3. How can we improve school attendance?

4. How can we reduce the number of people who get sick at school during cold and flu season?

Addressing questions like these leads students to identify topics they need to learn more about. In researching the first question, for example,

students may see that they need to research food chains and nutrition. Students often ask, reasonably, why they need to learn something, or when they'll use their knowledge in the future. Learning is most successful for students when the content and skills they're studying are relevant, and case studies offer one way to create that sense of relevance.

TEACHING WITH CASE STUDIES

Ultimately, a case study is simply an interesting problem with many correct answers. What does case study work look like in classrooms? Teachers generally start by having students read the case or watch a video that summarizes the case. Students then work in small groups or individually to solve the case study. Teachers set milestones defining what students should accomplish to help them manage their time.

During the case study learning process, student assessment of learning should be focused on reflection. Arthur L. Costa and Bena Kallick's *Learning and Leading With Habits of Mind* gives several examples of what this reflection can look like in a classroom:

Journaling: At the end of each work period, have students write an entry summarizing what they worked on, what worked well, what didn't, and why. Sentence starters and clear rubrics or guidelines will help students be successful. At the end of a case study project, as Costa and Kallick write, it's helpful to have students "select significant learnings, envision how they could apply these learnings to future situations, and commit to an action plan to consciously modify their behaviors."

Interviews: While working on a case study, students can interview each other about their progress and learning. Teachers can interview students individually or in small groups to assess their learning process and their progress.

Student discussion: Discussions can be unstructured—students can talk about what they worked on that day in a think-pair-share or as a full class—or structured, using Socratic seminars or fishbowl discussions. If your class is tackling a case study in small groups, create a second set of small groups with a representative from each of the case study groups so that the groups can share their learning.

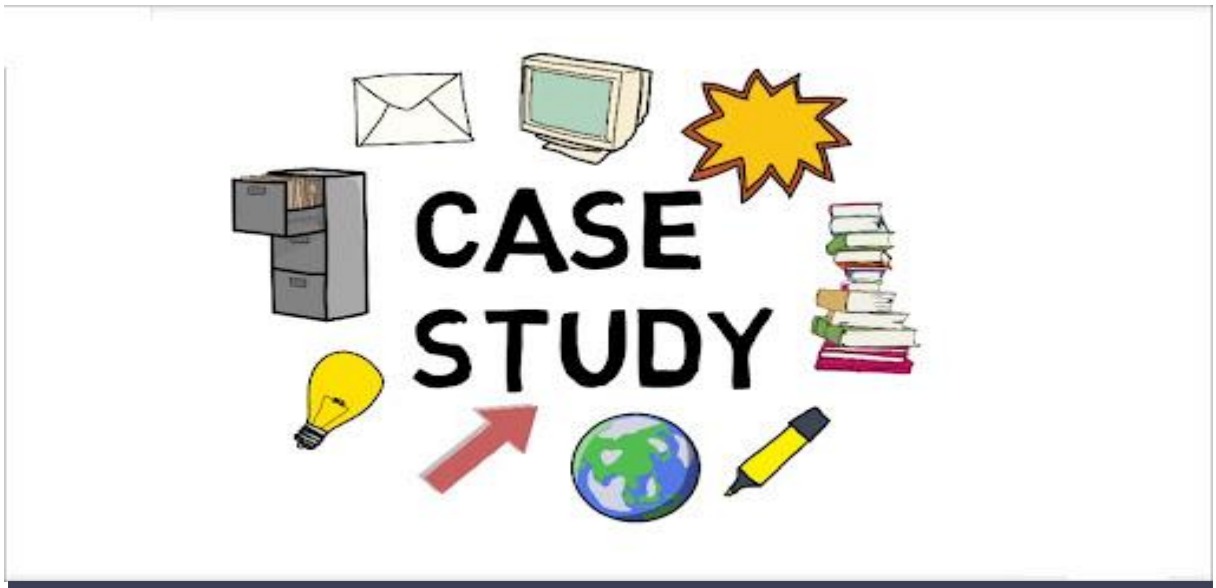
4 TIPS FOR SETTING UP A CASE STUDY

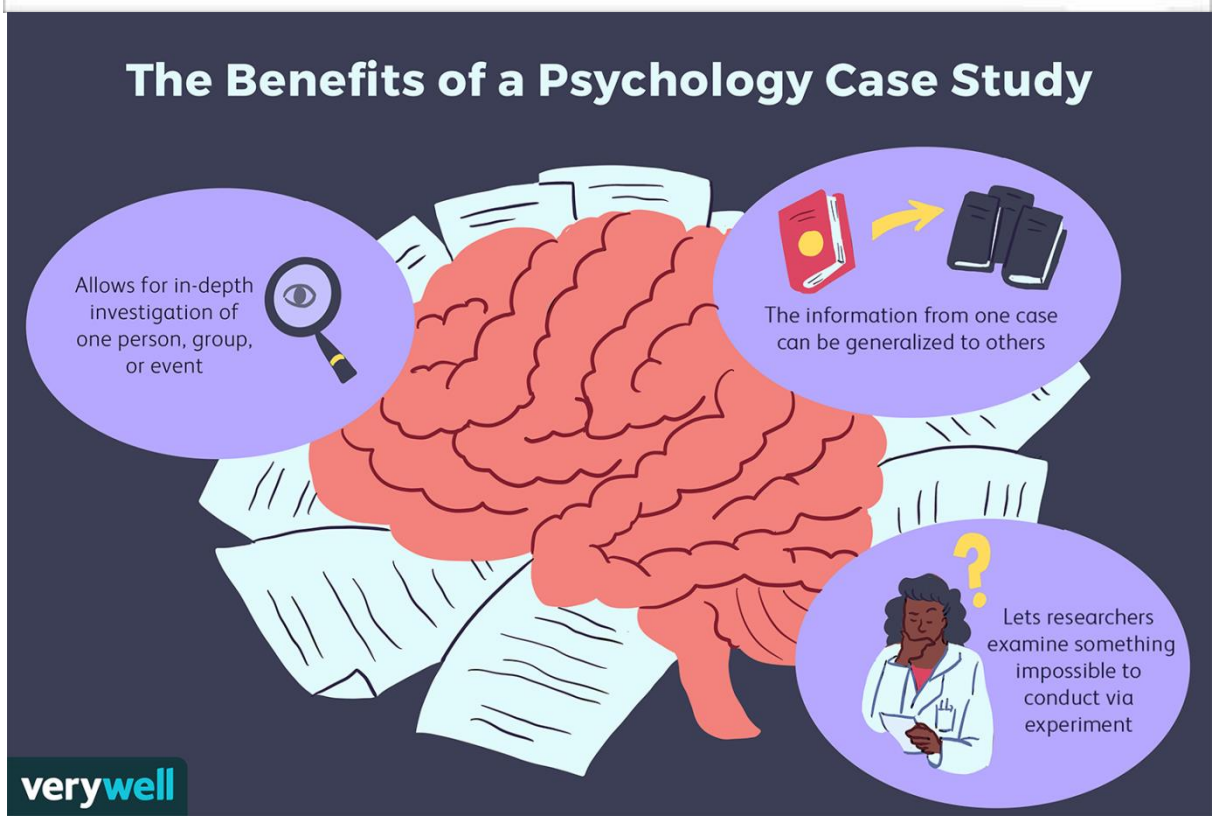
1. Identify a problem to investigate: This should be something accessible and relevant to students' lives. The problem should also be challenging and complex enough to yield multiple solutions with many layers.

2. Give context: Think of this step as a movie preview or book summary. Hook the learners to help them understand just enough about the problem to want to learn more.

3. Have a clear rubric: Giving structure to your definition of quality group work and products will lead to stronger end products. You may be able to have your learners help build these definitions.

4. Provide structures for presenting solutions: The amount of scaffolding you build in depends on your students' skill level and development. A case study product can be something like several pieces of evidence of students collaborating to solve the case study, and ultimately presenting their solution with a detailed slide deck or an essay—you can scaffold this by providing specified headings for the sections of the essay.





12.VIDEO CLIPS

Teachers are always striving to show more and tell less when introducing students to new information, concepts, and skills. Education researcher Pauline Gibbons tells us, “Rather than trying to simplify information, amplifying the curriculum means finding as many ways as possible to make key information comprehensible.”

New teachers often struggle to find ways to amplify their curriculum. Video clips can be a great tool to assist students in gaining that deeper understanding of content. It’s important to be mindful of how often and how much we use video—it’s important to have a clear purpose for using that film, documentary, or news clip.

PURPOSES FOR USING VIDEO

Building background knowledge on a topic. We know that students learn best when they take in information via multiple modalities—through reading, drawing, listening to the teacher’s oral explanations, and viewing visual media. We also know, from much research, that using visuals is key for those acquiring a new language. In California and many other U.S. states, we have a large number of English language learners (ELLs) in our schools. Images and videos support the learning of new content, concepts, and ideas.

An example: In a level one English language development class, students are in the early stages of their journey acquiring English. They’re working on a unit on weather, learning the words *hurricane* and *tornado*. The teacher turns on a five-minute video clip that shows examples of hurricanes and tornadoes and how their aftermaths differ. Students discuss what they saw in the video clip and write sentences using the new vocabulary.

Enriching a text or text excerpt. Whether they’re reading a piece of fiction or nonfiction, students benefit from contextualizing the person, place, or thing they’re learning about. Video clips can assist them in visualizing an event or a person, while setting the context historically, politically, socially, and emotionally.

An example: An 11th-grade history class is reading an article about the civil rights movement and Jim Crow laws. Before they read, the teacher shows an excerpt from Ava DuVernay's award-winning documentary *13th* that highlights the segregation and restrictive conditions of the South in the post–Civil War period. The visuals and audio reinforce students' reading, enhancing their understanding of the need for a civil rights movement.

Deepening or solidifying students' learning. Child-friendly how-to or instructional videos are readily available on the internet. Typically under seven minutes, these can serve to reinforce what students have learned or are already learning. YouTube, TeacherTube, and BrainPop, for example, provide brief instructional videos on different academic topics and subjects, such as how to do short division or how to write a letter. Watching a short instructional video created for kids is a nice break for students—and something novel or fresh can really stick with them.

An example: Fifth graders have been writing narrative essays. The teacher has provided instructions, a couple model essays, and a graphic organizer to help them write their first drafts. While they do that, she adds to the instructional mix a humorous five-minute video on the dos and don'ts of narrative writing as told by teenagers dressed as famous storybook characters.

TIPS FOR USING VIDEO

Be selective. A clip can have a big impact, so you'll want to pick the most dynamic and telling parts of the film, news segment, or documentary to show students. Be first clear on your purpose—that will help you determine what to show and how to frame it for students.

For upper grades, there might be a film that has value but is too racy or controversial. You don't have to dismiss it—just be strategic. In the film *Schindler's List*, for example, there's a lot of intense violence and some adult sexual content. So I showed only a few select clips to amplify my 10th graders' understanding of the Holocaust.

Provide a mission. How can we make sure students actively watch? Provide a mission before playing the video. For example, "As you watch, I want you to pay attention to...." Setting a goal for what students are about to watch will keep them accountable and attentive.

Pause to ponder (and write). Give students time to reflect by pausing the clip. Avoid having students do a task like writing notes or answering questions while they watch. This is especially difficult for ELLs. (For all of us, frankly. Try it.) Watch a few minutes and then pause the video to ask students to discuss what they just saw, write down reflections, or answer a question you provide. Pausing every few minutes allows students time to process what they're viewing, which is especially valuable if it's an information-packed video, or if you teach an early elementary grade.

Turn on closed captioning. Students can read along as they watch. For content-packed video clips, consider including the transcripts, as a handout or digital copy, especially if your students are going to be required to apply the information they learn from the video.

Why use video for teaching and learning?

The use of video in higher educational settings is accelerating rapidly in departments across all disciplines from humanities, sciences, and arts to continued professional curricula. Video can be used not only for teaching, but also for studying and learning in and outside the classroom.

Video in particular is often attractive as a means to capture lecture content and present direct instruction. Of all the technological components involved in the learning experience, it is often the most visible and the most resource intensive. It is easy then to assume that it will be the most impactful.

It is indeed a powerful medium, but as with anything else, video must be created with an eye for strong pedagogical choices in order to be most effective. Likewise, just as video is one tool in the media toolbox, lecture is one strategy on the instructional palette. Video can also be designed for presenting case studies, interviews, digital storytelling, student directed projects, and more. Choosing the appropriate instructional strategy and pairing it with an effective media format is part of the analysis performed during your course design process.

The aim of this resource is to identify a number of best practices to apply to the kinds of video you might produce as supportive material in relation to students' learning task to ensure that your video is as effective and engaging as possible.

What evidence is there that video will enhance teaching and learning?

It is important not to fall into the trap of considering that the use of technology or media is going to be the "silver bullet" that will make students learn or be more motivated. The learning activities that students perform with videos are a critical part of the learning outcomes and motivations (Boyle, 1997). That is, simply presenting information in a stimulating digital video format will not automatically nor necessarily lead to in-depth learning (Karppinen, 2005). Rather it is the pedagogy, the well crafted message, the whole approach, and design that are the critical elements, not the media.

It is the instructor's task "to create a coherent narrative path through the mediated instruction and activity set such that students are aware of the explicit and implicit learning goals and activities in which they participate" (Anderson et al., 2001, p.6). For the specific design and organization of learning activities with instructional material, answering these questions can help you to plan your lesson:

- What data do I have about my current course that suggests a change? How do I interpret that information?
- What does the research literature suggest about how students learn best with media and my subject matter?
- What preparation or support material will the students need?
- What kind of questions will I pose to students? When will I ask these questions?
- What kind of learning tasks will I align with the instructional material?
- What kind of media or delivery format will be most effective for communicating the instructional material? What value will the delivery format bring compared to other formats? When will I deliver these instructional materials?
- What model or approach will I use to create the narrative path?

Effectively Designed Video Can...

- Grab a student's attention, spark curiosity, and provide value to the course content.

- Show real life examples or case studies. Demonstrations focused on contrasting cases help students to achieve expert-like differentiation (Schwartz & Bransford, 1998).
- Stimulate a focused discussion guided by the instructor.
- Be an archived resource that students can access anywhere and anytime from first exposure to review and remediation.
- For certain topics and concepts video can help novice students who have lower prior knowledge process the concept you are teaching more easily (Reiser & Dempsey, 2007).
- Provide multiple perspectives of the same material rather than relying on a single viewpoint (Brunvand, 2010).
- Be reflective tools for learners as they work to integrate and apply new information into their preexisting knowledge by allowing students to comment and respond to the videos they view (Brunvand, 2010).
- Used to provide instructional material as an alternative to in class live lecture. It makes use of the subject matter and expertise of the instructor while also allowing the instructor to be "a guide on the side" in an active learning environment. Note, this does not suggest digitizing an in-class lecture but redesigning a lecture to serve a new purpose.
- Be added to a multimedia context such as an online lesson module or classroom presentation.
- Involve students in creating media as a way to assess their understanding. Student-led media projects encourage collaboration, accountability, creativity, and mastery of ideas and concepts.

Risks when Choosing Video

- Video as direct instruction or lecture capture is a less active experience than other strategies. It does not guarantee in-depth learning and thus should be paired with a meaningful learning activity.
- The content in a video is not easy to scan by the naked eye like text or images.
- Video can hinder students with higher prior knowledge who might benefit more with a different instructional format such as text or images. This is known as the expertise reversal effect (Kalyuga, 2007).
- If the message and design of the content are not well crafted then the video will not help; in fact no media format will help.
- Worked examples as text may be more effective and efficient for learning than a worked example as video (Sweller et al., 2013). Text is also a powerful medium with which to convey content. When designed well, text is easy to process and study. This can be especially true if providing multiple worked examples for comparison. Choose the formats wisely based on the type of instructional content and the prior knowledge of your audience. A proper literature review of educational research on your subject matter will save you time from choosing the incorrect presentation format or instructionalstrategy.

  Download this template to help you plan your lesson with video

  Before you even begin to design a video, take time to consider some basic questions.

- **Where does it make sense for me to use video?** What will it address more effectively, and what will it lack? How will it fit in to my larger class? Is it the best medium for the topic at hand? Some components of your lecture will work well in video. But some elements, such as solving problems, demand interactivity. Conversation or discussion with students also requires a different approach, possibly via in-class time, videoconferencing or a

Google Hangout. Think carefully about why you are choosing video with respect to your instructional strategies and learning objectives.

- **What are the learning objectives & goals for using video as opposed to other presentation formats?**
  Why am I using video, what is the need? What are the benefits and risks? What ideas can I effectively convey in a video?
  Be clear and explicit regarding the learning objective for a video, and eliminate tangential or digressive information that doesn't contribute to that objective.
- **How will I know if I have successfully conveyed the ideas?**
  Are assessment questions included after the video or in class?
- **When will I present the video to students?**
  As pre-work before class? In-class as a way to gain the attention of the class, as part of a larger presentation, or as a case-study for students to discuss? or will I provide it as a remedial study resource after class?
- **How will I incentivize students to actually watch, process, and reflect on the information in the video?**
  For example, are there follow up questions for students to answer that can assess their understanding of the video content?

Preparation Questions

- **Who is my audience?**
  How variable is the prior knowledge that your students bring to the material? What is their average age and comfort with online material? In the case of Global courses, geographical and cultural differences may impact how you present your material.

- **What is my turn around? How much time do I have to create the video/s?** The more robust and detailed the video you try to produce, the longer it will take to make. Plan ahead, allow yourself the time needed to produce a video, and remember that some content will fill different roles. A lecture you will reuse and share widely is worth spending time on. Conversely, a response to classroom discussion may be a simple webcam video, but it can be deployed much more quickly.

- **What materials do I already have prepared?**
  Utilizing appropriate visuals is critical to maintaining viewer interest and properly explaining concepts. You likely already have material like this that you use in your course. Review it before you begin. Decide which visuals are most effective and whether they should be expanded upon prior to recording.

- **What resources do I have to create the video/s?**
  Be sure to educate yourself about the resources available to you here at NYU. From the libraries and the Digital Studio, to the production facilities at NYU-TV, to the technologists at NYU's Global Learning and Innovation Group (GLI), can help you identify the more appropriate group to consult depending on the scope and nature of your project.

13.RECITATION

The recitation method, also known as the IRE cycle (initiation-response-evaluation) or the CDR method (conventional-direct-recitation) refers to a particular pattern used commonly by teachers. This pattern has stayed in place despite considerable criticism for hundreds of years. The cycle progresses from a teacher initiating an interaction, inviting a response (e.g. asking a question), and evaluating the response before beginning the cycle anew.

This system has been criticized as follows:

Questions asked are mainly low level, calling only for simplistic answers

Only one student is active at a time

Education is reduced to receiving pre-packaged knowledge and demonstrating its retention

Classroom conversation is inherently predictable, task-oriented, but unstimulating. Learning becomes sterile, non-emotional, and rule-bound. This system is ubiquitous around the world. However, about 75% of classtime in an average classroom is spent on the instruction stage. Less than 1% of time was spent on open questions that might ask for complex responses.

The recitation method has some advantages associated with overcrowded classrooms and the need to teach a rigid set curriculum. It is appealing to teachers because they remain in control of the interaction at virtual all stages and may speed up or slow down to any pace. However students learn little from just hearing teachers talk.

One of the major principles of learning is that the learner needs to be actively responding to get anything out of it. They do not necessarily need to respond overtly, they just need to be actively engaged. This is difficult to maintain for the long periods of time that teachers generally speak for.

The *redundancy effect* identified by cognitive load researchers states that when teachers talk for long periods of time, students are unable to determine which information is relevant and which is not. Effective teachers will explain material extremely well, but very briefly. Students will not learn simply by listening for longer periods of time. Mental focus drops up after perhaps 10 minutes.

Two theories underly this drop in mental focus, or *mind wandering*. One theory, known as *ego depletion* is that one's ability to focus intensely actually literally runs out through exhaustion, measured by brain glucose. So, your mind wanders in order to build up energy for the next upcoming demand that will be placed upon it. The second theory is known as *cascading inattention*. This refers to when the mind is unable to clearly process and organize incoming information and fit it into a simple framework and structure.

An alternative is formulated as the PDC (progressive-discovery-constructivist) approach although the chapter did not explain what this approach entails. Another alternative is tha Paideia model which states that learning takes place in three parts: didactic instruction, Socratic questioning, and coached product. Each of these hsould take up a third of time. However, Socratic questioning is the key and entails more than just students talking. Questions must promote higher order thinking; student talk is a means not an end.

Recitation Class: Know its Benefits and Challenges to Get the Most Out of it

Repetition is the foundation of accomplishment and allows you to apply what you have learned to achieve your goals. That's why recitation classes are so important.

A recitation class is a small class that complements a large lecture by focusing on the critical points from the lesson in a smaller setting. Students are guided by a teacher's assistant as they evaluate lecture content with their peers, asking questions and wrestling with their ideas as they develop a deeper understanding of the material.

A recitation class is going to be the foundation you need to complete your studies and finish with a proper understanding of the concepts you were taught.

When you go into college, you will have a variety of class types, that your curriculum is taught through.
These range from labs and lectures to seminars and recitations.
A recitation class is a little different from the other courses you will have.
This class can be incredibly beneficial to your learning; however, it can be a little challenging to make the most of it.

What is Recitation?

"Repetition is the mother of learning, the father of action, which makes it the architect of accomplishment" – Zig Ziglar

In its most basic form, recitation is the action of saying something aloud from memory or a formal reading.
This traditionally was a poem or a verse that has then progressed into essays that are presented to a teacher, peers, instructor/tutor, or even a combination.
Now, this has evolved again and is used throughout education from mathematics to science courses.
However, the style of recitation varies slightly, because let's be honest, it would be ridiculous reciting poetry in an engineering or chemistry class.

Understanding Recitation Class

The lecture format does not always meet the needs of all students in the lecture hall.
The recitation class is designed to serve as a supplement to this format, providing students an opportunity to learn from each other as a teacher's assistant (TA) guides the group's discussions and thought processes in an effort to ensure deeper learning takes place.
A recitation class is a complement class to a lecture.
It is designed to focus on complex points of the associated lecture that either have complicated material (i.e., math or science) or a large-sized class where messages can get lost.
It's important to remember that the lecture aims to teach many students; however, not every student's academic needs are adequately addressed, so a recitation class focuses on this and fills in any gaps.
Depending on the subject, each recitation class may be structured a little differently.
A recitation class that is a complement to a mathematics or engineering lecture will often utilize this section by performing derivations, solving problems, and ensuring that students have a proper understanding of methods and applications.
Scientific classes (ie. biology, chemistry and physics) use their recitation class to clarify anything that was not fully understood during the lecture or was not able to be adequately covered due to time constraints.
When it comes to English/language courses, recitation classes will iron out any issues with pronunciation, prose, multiple meanings while promoting a deeper understanding of the material.
Overall, a recitation class allows a student to clarify anything that they were unsure about as well as ask questions about particular concepts and review the material.

The Purpose of a Recitation Class

Your recitation class is incredibly valuable, and you should not take it for granted.
One of the primary purposes of a recitation class is to help students learn how to apply the information and concepts from the lecture.
Another purpose is to provide you with the opportunity to go over any material that you are not fully understanding, anything that you need clarifying and to iron out the creases in your studies. 4
It is the utmost importance that you understand the concepts properly so you can apply them correctly.

Elements of a Recitation Class

A recitation class can vary a little depending on the course and what the professor has outlined and instructed the TA/instructor to do.
It is usually about interactive learning with other students and personalizing interactions with the professor or TA, so academic needs are met. 4
The smaller group allows students to develop their confidence to ask questions and fully participate in discussions, without the stress of a large audience, ensuring the student can grasp concepts and accomplish their goals fully.

A Recitation Class Usually Consists of the Following Elements:

- Group work
- Opportunities to ask questions
- Clarification of points from the lecture
- Written or discussed examples of concepts from the lecture
- Discussion of lecture or material from the course
- Quizzes/Worksheets
- Review of homework, quizzes, and assignments
- Preparation for exams

What's the Difference Between A Recitation Class and A Lecture?

The difference between a recitation class and a lecture is the format and size fo each class. Lectures are usually delivered by a professor to an audience in a large hall with little interaction. Recitation classes are delivered by a TA in a smaller setting. They support the students in the lecture class by encouraging discussion and deeper exploration of exploration ideas.
It is essential to understand the differences between a lecture and a recitation class, so you can take advantage of both classes fully.

Lecture defined:

(noun) An educational talk to an audience, especially one of students in a university
(verb) Deliver an educational lecture or lectures (source)
A lecture is scheduled to address a large class about the material or a particular concept of a course.
It is where you will learn new ideas and the content you need throughout your studies.
However, during a lecture, not many examples are shown to save time and ensure you get all the material you need in the allocated time.
Teaching many at once is much more efficient, especially when introducing new material that is the main reason for a lecture.
It can provide a lot of valuable information that you may not be able to find anywhere else and can only get from your professor.
This information can be incredibly useful, especially when it comes to exams and assessments.

Recitation defined:

(noun) The act of repeating something that has been previously learned, usually memorized
(noun) Material that is spoken aloud
(noun) A class that is scheduled in conjunction with a lecture (source)
A recitation class is designed to address any gaps from the lecture, so you have the opportunity to grasp the material thoroughly.
Usually, no new material will be taught during your recitation classes, and it will only be reviewing and going over the content from the lecture.

There will be more examples and further explanation of material from the lecture to ensure you are understanding the processes and reasoning, not just fumbling your way through it.
Your recitation class also gives you the option of being taught the material in a different style or manner, if you are struggling with grasping it.

Advantages and Disadvantages of the Recitation Method

Advantages

Instructors
Having instructors or TA's for the recitation classes can be quite beneficial.
Students can gain valuable insight, advice, and strategies that can be tailored to their needs.
This ensures that student have a better chance to learn the material they need for the course.

Assignments/Homework
A professor will not have the time to answer all the questions students may have about an assignment.
This can be problematic. Although they know what they meant to say, it doesn't always come across clearly.
A recitation class instructor has the opportunity to look a little closer at the details, more in-depth into particular topics and take the time to fully understand student queries as well as the information they need to feel like issues have been resolved.

Material
The recitation style allows students to dive into the content from each lecture thoroughly.
It can reveal important points that may have been missed during class.
Feedback is essential; during this period students have the opportunity to discuss the materials with classmates and the TA, as they work to strengthen their understanding of the content so that they can put themselves in the best position to earn a high grade.

Recap
Sometimes students do not necessarily want to ask a question or get involved in a discussion because they are not sure if they should already know what is being asked of them.
In short, they are worried about appearing behind or not with it and are embarrassed.
Recitation classes take some of the pressure off because the students get to know each other and the TA.
They develop trust over time and begin to realize that everyone has good days and bad days.
Interaction is naturally encouraged through the small group setting.
Students begin to realize that others in their class are struggling with similar topics that are bothering them.
Together, they can explore these topics, seeks answers, better prepare for assessments, and leave the course understanding more of the content than if they were not in the recitation class.

Confidence
The style of the recitation class naturally builds confidence in students because it encourages them to interact with their peers.
This works both ways. Students who don't understand a topic will be more likely to inquire about it.
Students who do understand a topic now have the opportunity to share the information with others and deepen their own mastery of the content.

Disadvantages

Instructor

Sometimes the instructor is not a good fit for the class or a particular student, which can cause confusion and make the class unbearable to students.
This can be avoided by proper training and communication with the corresponding professor.
Unfortunately for the student, sometimes this can not be avoided, and it will impact the student's ability to learn and understand concepts properly.

Anxiety/Pressures

It can be stressful for some students to be required to interact with peers, which causes a lot of anxiety and pressure.
Sometimes students can feel overwhelmed by the pressure, leading to a negative impact on their studies and grade.

Rehashing

Students who already understand the material may feel like they are unnecessarily being forced to study the content twice.
This can impair their learning as they become disengaged while the instructor is trying to get everyone else caught up.

Effective Recitation Class Methods

A study was conducted where 272 students were divided into four groups.
Each group was taught the same topic using four different methods of recitation teaching to see which was the most effective and what one the students preferred. The results concluded:
The most effective method for teaching recitation classes is students working in cooperative learning groups in which the experienced/trained instructors ask questions using Socratic dialogue (source).
This method allows students to work in groups under the guidance of the instructor and with the support of peers.
If a misconception arises, the instructor can direct their attention to resolving the misunderstanding to ensure that there is a strong conceptual understanding.
The process they use to accomplish this is asking questions that encourage them to arrive at the correct answer.

Key Elements of this Method

- Cooperative learning groups
- Guidance of instructor
- Socratic dialogue (lots of questions)
- Experienced/trained instructor

Benefits of Recitation Class

Recitation class offers many benefits that lectures simply do not.
It is critical that they are offered alongside lectures so students have the opportunity to think deeply about the content is riddled with interrelated concepts that need exploring the facilitate understanding. Some of the benefits include:

- Clarity of concepts, processes, and reasoning
- Confirmation on formulas, applications, and any specific problems
- Testing of understanding to determine areas where improvement is needed
- Dedicated time for reflection

Preparation for Recitation Class

To get the most out of a recitation class, there are a few things that students can do:

Prepare

Go over notes from the lecture before recitation class and write down any questions, concerns, or concepts they are struggling with.
They should do the same with homework, assignments, and even past quiz questions.

Note-taking

Note-taking skills are vital to be able to evaluate the areas and concepts in which a student wishes to improve.
They should make sure they have a preferred method of note-taking that works for them and allows them to keep up with the pace of the professor during the lecture.
Some helpful note-taking styles are Harvard and Cornell.

Communicate

Proper communication with the instructor and professor is essential.
If a student has a lot of questions they should email before the class to try to get out in front of the challenges they are facing so they can attend the next class up to date on their understanding of the content.

Participate

Students should do their best to be fully engaged in the class.
This means adding value by sharing their understanding of concepts which they fully grasp and asking about concepts about which they are unsure.
Students sometimes need to be reminded that if they have a question about a subject, it is likely that other students in the room do as well.

Follow up

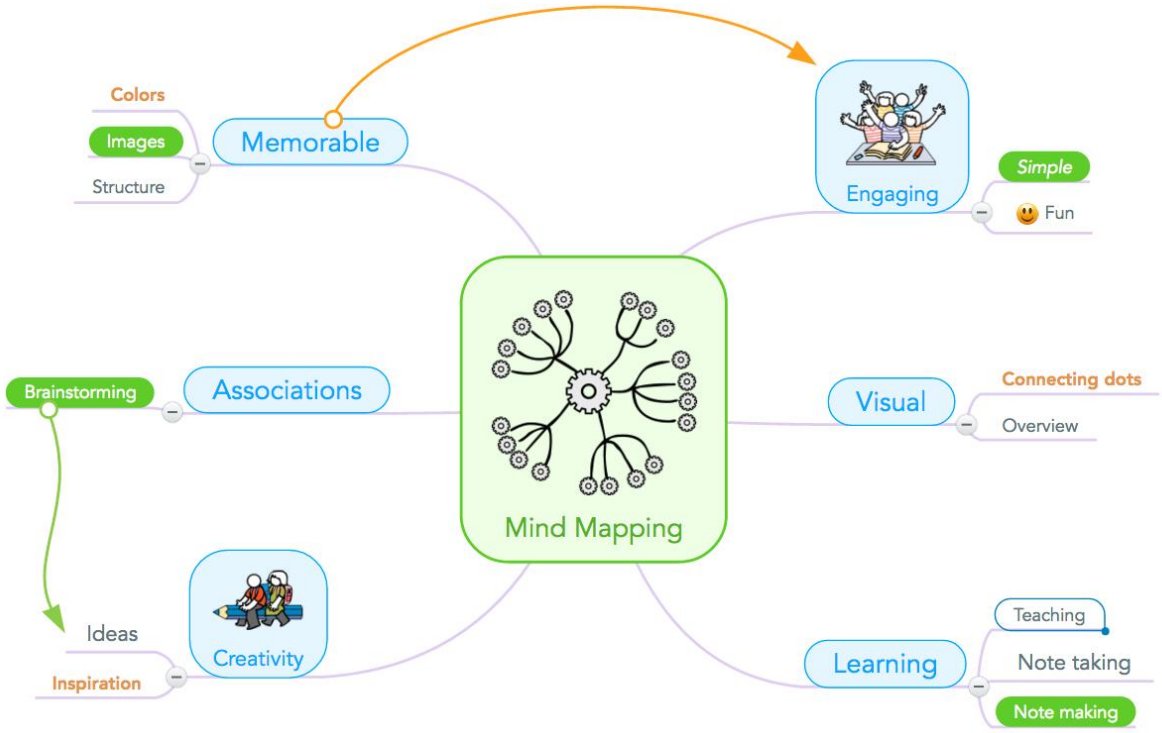
Sometimes a recitation class will create more confusion about a topic than it solves.
This is nothing to be embarrassed about.
Students should follow up with their and seek clarification on the points that made the content more difficult to understand.

Final Thoughts

The recitation class is a powerful tool that colleges use to give students in large classes the opportunity to dive deeper into the content in a guided setting with their peers.
When implemented effectively, it can be a highly effective resource for students who benefit from learning in a smaller setting.
The best recitation classes are shaped by the feedback of the students within it.
Students who wish to make their recitation class better should communicate with their TA and let them know what strategies work best for them.
A good TA will be receptive to constructive feedback.
They know that they are there to help their student

14.MIND&PUZZLE MAPS

Thousands of teachers all over the world already use and teach mind mapping in their classrooms. As one of the most effective learning techniques, mind mapping can help students take better notes, improve comprehension, and foster creativity.



Research from author and visual-thinking expert Nancy Margulies found that when children learn to write down concepts on lined paper rather than visualize those concepts mentally, their creativity begins to fade. Mind mapping helps students reignite their creativity, promoting ideas through association, and introducing an engaging, visual, and memorable approach to learning.

In this guide to mind mapping for teachers, we'll provide an example mind map lesson plan you can use to teach your students the basics of mind mapping, offer four example mind mapping activities you can do in class, and even show you how you can use mind maps every day in the classroom to make your lessons more interactive and engaging.

MindMeister is an excellent mind mapping tool for teachers and students. Here are some of the benefits of using MindMeister to build mind maps in an educational setting:

- It's an online tool that lets students collaborate with their teachers and peers and doesn't require any special software to be downloaded to a student or school computer.
- It arranges bubbles neatly as they're added, so there's no need to draw and redraw mind maps over and over again due to the confines of a sheet of paper.
- Students can add images and links to their mind maps, making it easier for them to collect all of their notes and sources in one place.

Use This Mind Map Lesson Plan to Teach Mind Mapping

If you want a simple way to teach mind mapping to your students, you could simply walk your class through our Mind Mapping 101 course, a 50-minute, 10-lesson collection of tutorials that will help everyone get familiar with the basics of mind mapping.

But if you want to take a more interactive approach, use this example mind map lesson plan.

Step 1: Start by building a mind map as a class

During class, begin by writing "I work best when…" in the center of the board. Get the ball rolling with a few examples: "I work best when I've recently played a sport," or "I work best when I've sketched out my ideas using colorful pens." Write each example on a new line that connects it to the center.

Next, invite your students to provide suggestions and add them to the board as they are given, connecting each suggestion to the center with a new line.

You'll soon end up with a basic mind map.

If your students have used mind mapping before, they may recognize the format. If not, introduce the concept and discuss some of the benefits with them.

On the projector, you could also share some examples of how students can use mind mapping in class to take notes, when brainstorming for an essay or project, or at home while reading or studying. Check out our student's guide to mind mapping for lots of relevant examples to share.

Step 2: Make a dreaded assignment easier with mind maps

Students often dread writing essays, so they're sure to be grateful for learning a new trick that will make the task easier. As it so happens, one of the best uses of mind mapping is for essay writing.

Using mind maps, students can easily brainstorm ideas for the topic of their essay; they can collect arguments, quotes, and other information from various sources; and they can visually outline the structure of their essays.

Students are sure to warm up to the mind mapping technique once they see how much easier it is to write an essay when they've first visualized all of their arguments and created a proper structure for them.

We've put together a step-by-step guide on essay writing with mind maps that you can study before introducing the ideas to your class or share with your students.

Step 3: Have students create a mind map for homework

Assess pupil progression by setting your students the task of creating their own mind map for homework using a home or school-library computer.

Building a mind map for simple brainstorming is a good way to get them started as there are no right or wrong ideas and students are completely free to note down any and all thoughts related to the topic they are given.

If you're planning on giving students a writing assignment about a certain topic, ask them to brainstorm ideas for the essay in a mind map first.

4 Example Mind Mapping Activities for Students

If you aren't planning to have your students write an essay anytime soon, that's okay. You can simply substitute step two of your mind map lesson plan with any of the mind mapping activities for students below, many of which were recommended by teachers in the MindMeister community.

1. Revision mind map

A few weeks or months after introducing students to a new topic is the perfect time to do a quick review of what you've learned so far in order to deepen students' understanding of the material and help them memorize it long-term. Creating a revision mind map is perfect for this purpose.

At the beginning of class, ask your students to open a new, blank mind map in MindMeister and write your subject and the year in the center of the map. If you're covering a specific theme or subject area this year, they can write that in the center topic as well.

Now, give students five minutes to create a mind map of the material you've covered so far. The structure of the map is not important at this point. Instead, students should do a kind of brain-dump where they let their thoughts flow freely and simply note down anything they can remember.

They may end up with something like this:
When the five minutes are over, project your own version of the mind map onto the screen. You can either prepare it up front or create the map live in front of the students' eyes. Ask students to compare their brain-dump to your map, adding keywords they may have left out and rearranging their topics to fit with your structure.
To finish this exercise, tell students what you will be discussing today, and show them how this new topic connects to what was covered before. Ask them to add this new topic to the mind map in the appropriate place.

2. Mind map presentation

Mind maps aren't just great for brain-dumps, they're also fantastic presentation tools. They show how individual pieces of information are connected and let students see the bigger picture. This helps them comprehend and retain information more easily.
Instead of having students create slide decks for the next topic they're going to present to the class, have them create a mind map. This will help their peers spot connections and will prevent students from just reading from a slide deck while presenting.

3. Group assignment

Group assignments are supposed to encourage collaboration between students. In most cases, however, one or two students will sacrifice themselves to do all the work while the rest will just goof off and play with their phones.
Group mind mapping can change that. Tools such as MindMeister enable multiple students to all work on a mind map at the same time. In contrast to a bullet-point list or text document, everyone can easily add their own contributions to the map wherever they fit.
MindMeister also offers a historical view of all of its maps, allowing you to replay the entire change history of a mind map and see exactly who contributed what and when.

4. Reading comprehension exercise

Taking notes in a mind map while reading a complicated text can help students break down the information into more manageable chunks. They are able to capture thoughts and questions that arise while they're reading, and they can visualize connections between individual arguments and facts presented to them.
A good way to ensure they capture the key points of the text is by providing them with a mind map template that they can fill in at home. A typical reading comprehension template for a novel might include branches for the main characters, themes, motives, plot points, and some background information about the book and the author.
For nonfiction texts, a typical template could look something like this:
Of course, the same principle can also be used to help students comprehend a complicated movie, documentary, or play.
When they're done, students can either share their mind maps with you (via link or email) or discuss them in a group setting in class.

Mind Mapping for Teachers: 6 Ways to Use Mind Maps in the Classroom

Mind mapping isn't just an activity you teach to your students, it's also one you can actively use every day in the classroom to improve collaboration and achievement.
Students are more likely to understand and retain information when it's displayed through a combination of words and imagery. Mind maps offer a fantastic format that combines not only words and images but also colors, a graphical structure, and other mental triggers that improve long-term memory.
Here are six great ways you can use mind maps in your classroom and lessons every day.

1. Create a curriculum overview or lesson plan

At the beginning of the semester, prepare a curriculum overview or lesson plan mind map that provides an introduction of all of the topics you're planning to cover.
You can also add exam dates and learning goals to the mind map and attach worksheets. Then, share this map with your students so they can use it as a guide during the semester and find out what they need to catch up on if they've missed a class.

2. Organize and manage class projects

If you're planning a project with your students, you want to make sure everyone knows exactly what they are supposed to do. What's more, you probably want a central place where all project-related information is stored and can easily be accessed and updated.

A mind map is a great format you can use to create a visual overview of a whole project. You can add a description of the assignment, provide deadlines, add links to useful websites, embed examples, and more.

3. Create engaging presentations in less than three minutes

Mind maps are a great tool to present complex concepts to your students. Drawing a mind map live in front of your students will help them follow your train of thought more easily. They will also be able to see how individual ideas are connected, and when your map is finished, they will be able to see the big picture.

You can use MindMeister to put together a mind map and then simply turn it into a slideshow. The great part about this is that it takes no time at all—you can create an engaging presentation in less than three minutes. Take a look at the real-time video below to see how this works:

4. Create discussion templates and foster critical thinking

Create topic and discussion templates and circulate them to all of your students. These templates may either be filled in by students or used as a springboard to create their own maps.

Anthony Valentin, a World History teacher at New York City's Stuyvesant High School, says, "I often use MindMeister to elicit responses to questions posed after students had watched a film or read a document. Other students can then edit and/or substitute their own commentary."

"The goal is to get students to critically think about sources and share their thoughts. We review the work in class by projecting the mind map on a screen," Valentin says.

5. Facilitate oral exams and lesson reviews

If you want to test how much a student knows or understands about a certain topic, let them draw a mind map about it and explain it simultaneously, either on the blackboard or on a piece of paper. This will give you insight into the student's thought process and show whether they've really grasped the fundamental ideas of the topic and how they're connected.

At the same time, the act of drawing the mind map will put your student's brain into action. Instead of forgetting big chunks of information due to nervousness and stress, the mind map will help them relax and enable their brains to retrieve information more easily.

6. Create games, quizzes, and questionnaires

The use of mind maps isn't limited to brainstorming and project planning. You can also use this versatile tool for games, quizzes, and questionnaires.

For example, here's a "Find the matching pairs" mind map, or check out the simple geography quiz below:

There Are Lots of Ways to Use Mind Maps in the Classroom

We hope you now feel ready to teach mind mapping to your students and thus provide them with a valuable skill they will benefit from for the rest of their lives.

Besides essay writing, mind mapping can be helpful for all kinds of educational tasks such as note-taking, creating engaging presentations, and more.

For more ideas on how to utilize mind maps in the classroom, take a look at these articles:

- Case Studies: Mind Mapping in the Classroom
- Get Inspired With These 13 Mind Map Examples
- 8 Lesson Ideas That Promote Lifelong Learning

15.FISH BOWL

Fishbowl is a strategy for organizing medium- to large-group discussions. Students are separated into an inner and outer circle. In the inner circle or fishbowl, students have a discussion; students in the outer circle listen to the discussion and take notes.

Fishbowl is a strategy for organizing medium- to large-group discussions. Students are separated into an inner and outer circle. In the inner circle or fishbowl, students have a discussion; students in the outer circle listen to the discussion and take notes.FISH BOWL STRATEGY

Fishbowl is a strategy for organizing medium- to large-group discussions. Students areseparated into an inner and outer circle. In the inner circle or fishbowl, students have adiscussion; students in the outer circle listen to the discussion and take notes.

This engaging and student-centered strategy builds comprehension of complex texts/ideaswhile developing group discussion skills. In the "fishbowl," students practice respondingto multiple viewpoints. Observations from students in the outer circle provide insight intowhat makes for effective small-group discussions. Research supports the use of fishbowlsas an effective way to engage students with a range of abilities and in multiple settings.

STEPS:

1. Choose a central topic or text. Develop an open-ended question to start the discussion. If using a text, students may read the text before hand or the strategy may be used to introduce the text (i.e., create a question that makes the central them relevant to the students).

2. Ask for or select 4-5 volunteers to be in the "fishbowl." Only the students in the fishbowl are allowed to talk. After a class demonstration with one "fishbowl", there can be several "fishbowls" organized in the classroom to ensure that all students are engaged.

3. Instruct the outer circle to remain quiet, observe and take notes on the content and process of the inner circle's discussion.

4. The first few times, play the role of the facilitator yourself. Once the process is familiar, select a student facilitator. The facilitator does not participate in the discussion, but poses questions along the way to prompt deeper discussion and to ask sure everyone inside the fishbowl has a chance to talk.

5. At first or with younger students, identify the focus of the discussion and provide text dependent questions for students to answer during the fishbowl discussion.

6. Allow the conversation to progress where students take it. Rotate students in and out of the fishbowl throughout the course of the discussion. Set up a procedure ahead of time so students know to expect this rotation. Allow the fishbowl discussion to continue for at least 15- 20 minutes, depending of the students' age.

7. After all students have rotated through the fishbowl, divide the class into small groups and invite students to debrief. Students can use their observations from the

outer circle to highlight strengths of the discussion and make suggestions for ways to engage each other more meaningfully. The following discussion starters may facilitate the conversations:

• What did you observe during the discussion of the text?
• What is one thing you heard that is similar to your point of view?
• What is one thing with which you disagree?
• How did you feel while on the outside of the fishbowl?
• How did you feel while on the inside of the fishbowl?

8. Wrap up the process with a full class discussion about the discussion Pose a final question and give everyone an opportunity to talk to a partner. After this discussion, you may have the students do a quick write answering the guiding question.

9. Add these specific questions to scaffold the experience for Emergent Bilinguals:

• Observer question: What helped you understand the information that was being shared (context or non-verbal cues, use if L1, etc)?
• Fishbowl questions: How do you feel knowing that peers were listening to what you were saying? What do you wish you could have said more clearly or what point do you wish you could have made in you first language?

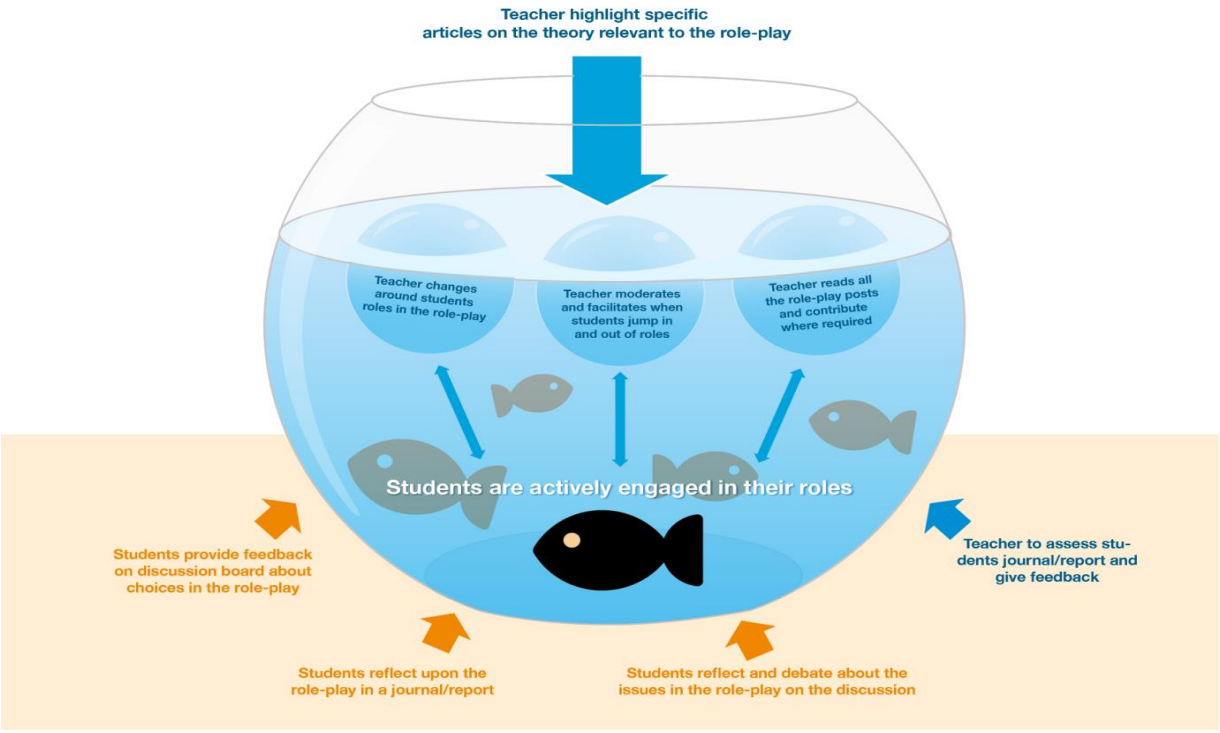
SAMPLE FISHBOWL GUIDING QUESTIONS:

Observers:

• Was it difficult to not respond to the fishbowl students? Why or why not? If so, what kinds of comments did you want to respond to?
• Did you hear anything from the fishbowl that surprised you?
• What helped you understand the information that was being shared (context or non-verbal cues, use if L1, etc.)?

Fishbowl students:

• How did it feel to share your feeling/thinking about the text knowing that your peers were listening closely?
• Do you usually have opportunities to share your perspective on _____?
• What do you wish you could have said more clearly or what point do you wish you could have made in you first language?



Fishbowl

Rationale

In a Fishbowl discussion, students seated inside the "fishbowl" actively participate in a discussion by asking questions and sharing their opinions, while students standing outside listen carefully to the ideas presented. Students take turns in these roles, so that they practice being both contributors and listeners in a group discussion. This strategy is especially useful when you want to make sure all students participate in a discussion, when you want to help students reflect on what a good discussion looks like, and when you need a structure for discussing controversial or difficult topics. A Fishbowl discussion makes for an excellent pre-writing activity, often unearthing questions or ideas that students can explore more deeply in an independent assignment.

Procedure

1. **Select a Topic**
   Almost any topic is suitable for a Fishbowl discussion. The most effective prompts (questions or texts) do not have one right answer or interpretation, but rather allow for multiple perspectives and opinions. The Fishbowl strategy is excellent for discussing dilemmas, for example.
2. **Set Up the Room**
   A Fishbowl discussion requires a circle of chairs ("the fishbowl") and enough room around the circle for the remaining students to observe what is happening in the "fishbowl." Sometimes teachers place enough chairs for half of the students in the class to sit in the fishbowl, while other times teachers limit the chairs further. Typically, six to 12 chairs allows for a range of perspectives while still giving each student an opportunity to speak. The observing students often stand around the fishbowl.
3. **Prepare for the Discussion**
   Like many structured conversations, Fishbowl discussions are most effective when students have had a few minutes to prepare ideas and questions in advance.
4. **Discuss Norms and Rules**

There are many ways to structure a Fishbowl discussion. Sometimes teachers have half the class sit in the fishbowl for ten to 15 minutes before announcing "Switch," at which point the listeners enter the fishbowl and the speakers become the audience. Another common Fishbowl discussion format is the "tap" system, where students on the outside of the fishbowl gently tap a student on the inside, indicating that they should switch roles. See the variations section below for more ideas about how to structure this activity.

Regardless of the particular rules you establish, make sure they are explained to students beforehand. You also want to provide instructions for the students in the audience. What should they be listening for? Should they be taking notes? Before beginning the Fishbowl activity, you may wish to review guidelines for having a respectful conversation. Sometimes teachers ask audience members to pay attention to how these norms are followed by recording specific aspects of the discussion process, such as the number of interruptions, examples of respectful or disrespectful language being used, or speaking times (who is speaking the most or the least).

5. **Debrief**

After the discussion, you can ask students to reflect on how they think the discussion went and what they learned from it. Students can also evaluate their performance as listeners and as participants. They could also provide suggestions for how to improve the quality of discussion in the future. These reflections can be in writing, or they can be structured as a small- or large-group conversation.

Variations

1. **A Fishbowl for Opposing Positions:** This is a type of group discussion that can be utilized when there are two distinct positions or arguments. Each group has an opportunity to discuss the issue while the other group observes. The goal of this technique is for one group to gain insight about the other perspective by having this opportunity to listen and formulate questions. After both sides have shared and listened, students are often given the opportunity to discuss their questions and ideas with students who are representing the other side of the argument.

2. **A Fishbowl for Multiple Perspectives:** This format allows students to look at a question or a text from various perspectives. First, assign perspectives to groups of students. These perspectives could represent the viewpoints of different historical figures, characters in a novel, social categories (e.g., young, old, male, female, working-class laborer, industrialist, peasant, noble, soldier, priest), or political/philosophical points of view. Each group discusses the same question, event, or text, representing the assigned perspective. The goal of this technique is for students to consider how perspective shapes meaning-making. After all groups have shared, students can be given the opportunity to discuss their ideas and questions with peers from other groups.

3. In a fishbowl discussion, people seated inside the circle actively participate by asking questions and sharing their opinions, while those standing outside listen carefully to the ideas presented.

Example

16.THINK PAIR SHARE

Think-Pair-Share

Think-pair-share (TPS) is a collaborative learning strategy where students work together to solve a problem or answer a question about an assigned reading. This strategy requires students to (1) think individually about a topic or answer to a question; and (2) share ideas with classmates. Discussing with a partner maximizes participation, focuses attention and engages students in comprehending the reading material.

Why use think-pair-share?

- It helps students to think individually about a topic or answer to a question.
- It teaches students to share ideas with classmates and builds oral communication skills.
- It helps focus attention and engage students in comprehending the reading material.

How to use think-pair-share

- Decide upon the text to be read and develop the set of questions or prompts that target key content concepts.
- Describe the purpose of the strategy and provide guidelines for discussions.
- Model the procedure to ensure that students understand how to use the strategy.
- Monitor and support students as they work through the following:

T : (Think) Teachers begin by asking a specific question about the text. Students "think" about what they know or have learned about the topic.

P : (Pair) Each student should be paired with another student or a small group.

S : (Share) Students share their thinking with their partner. Teachers expand the "share" into a whole-class discussion.

Examples

Language Arts

Use think-pair-share to deepen discussions about specific characters in books the class is reading together. For example, if the class is reading *The Great Gilly Hopkins* by Katherine Paterson, try think-pair-share to respond to questions such as, "Would you be able to be friends with Gilly? Why or why not?"

Math

Try think-pair-share for math problems with more than one correct answer, such as estimation, patterns, and logic. This strategy can also be used when students are deciding how to approach a math problem.

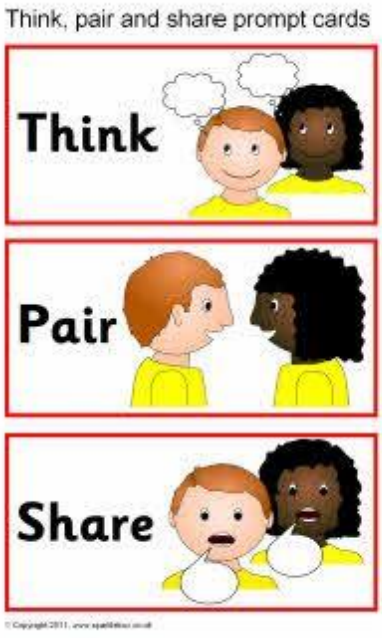
Social Studies

Jumpstart a think-pair-share discussion by asking a gbroad question relevant to a new unit of study, such as, "What do you already know about the Civil War?" As students dig into more

difficult topics, you might ask questions such as, "Would you have agreed to be a 'stop' on the Underground Railroad? Why or why not?"

Science

Use think-pair-share to help students form hypotheses or to discuss their interpretations of a class experiment. For example, before an experiment on density, students might be asked to use the think-pair-share strategy when deciding which items will float in a tub of water.



17.FLOW CHARTS

Flowcharts in the classroom are **graphical representations of students' thinking processes**. It allows students to chalk out their ideas and thoughts in a logical and organized fashion, giving them the freedom to come back and reflect on it.

Flowcharts in the classroom are graphical representations of students' thinking processes. It allows students to chalk out their ideas and thoughts in a logical and organized fashion, giving them the freedom to come back and reflect on it. With this method, a student is able to describe a sequence of events or actions in a step-by-step fashion, leading to its outcome.

Using a flowchart has also been found to help develop reading comprehension in students of all levels. It is a useful tool for students to learn as it will often be used in business meetings and for presentations in the future.

While drawing a flowchart, one starts with their first thought or action point and draws it in a box. The remaining action points are placed one by one in boxes in a sequential manner. Arrows connects the boxes in the right order. Ensuring that the boxes are in order is an important element in drawing a flowchart as the idea changes according to the order.

There are a number of exercises that may be done with flowcharts in the classroom. Some of them are: drawing the plot of a movie that the students saw recently, the process of making cheese, how much money they should save to buy something they really want, etc.

Flowcharts help develop a number of skills in the classroom. Some of those skills included:

- Understanding what a sequence is,
- Understanding the different stages in reaching their goal,
- Understanding the link that the different stages have, and
- Understanding the final goal.

Some of the limitation of flowcharts are:

- Flowcharts tends to over-simplify a process,
- Factors that affect the sequence are not depicted,
- The process of creating a flowchart may seem futile to some students, thus reducing their attentiveness and enthusiasm in the task.

It is suggested that you use flowcharts to compliment your lesson and add knowledge and value to it, instead of focusing on it as an exercise on its own.

Flow Chart

A flow chart is a visual diagram that shows the steps of any process from beginning to end, using process boxes, flow lines/arrows and other symbols.

Flow charts are incredibly versatile and can be used to illustrate all sorts of different processes. Some of the processes you may have seen represented as flow charts i the past include:

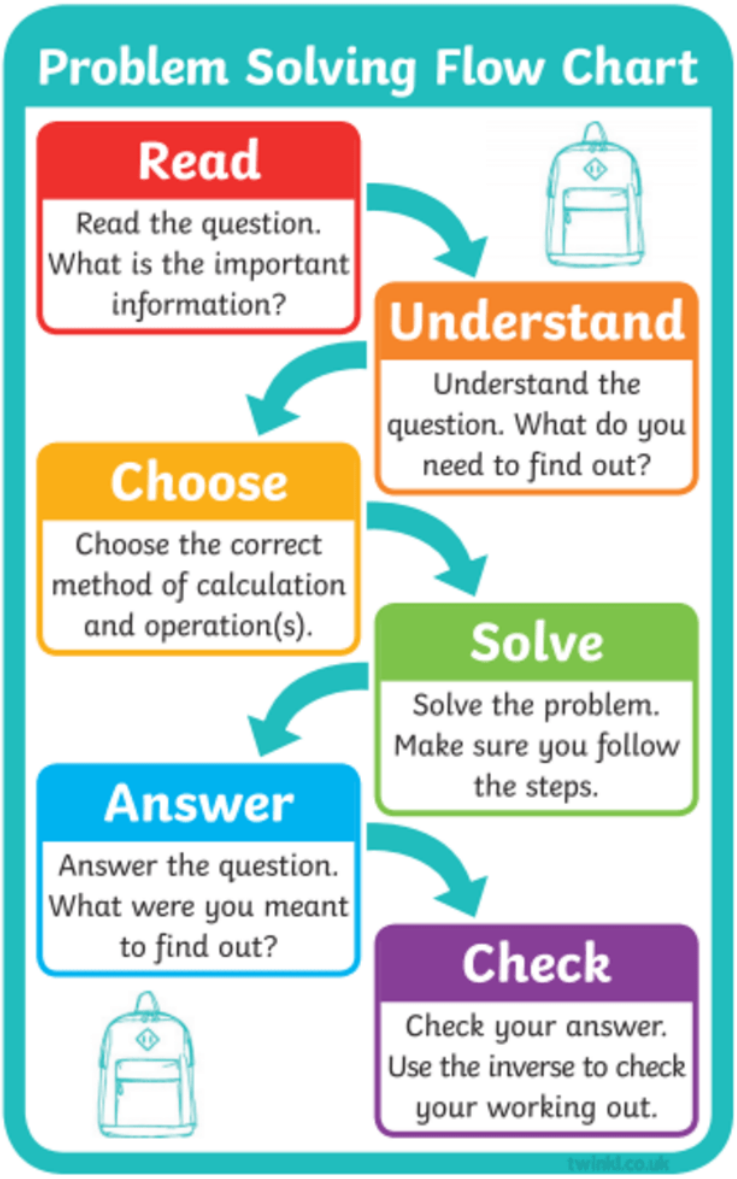
- Instructions for putting together a flat-packed shelf.
- Directions for making a jam sandwich.
- Workplace procedures for getting out of a building in case of a fire.
- The life cycle of a butterfly.

- How coffee goes from the coffee plants in places like Brazil to the mugs in your local cafe.

Flow charts are also sometimes called process maps, and as you can see, they have many applications. To see some visual examples of flow charts, find out how flow charts can be utilised in a classroom setting, and learn how to construct your own flow chart templates using internationally recognised flow chart standards, read on.

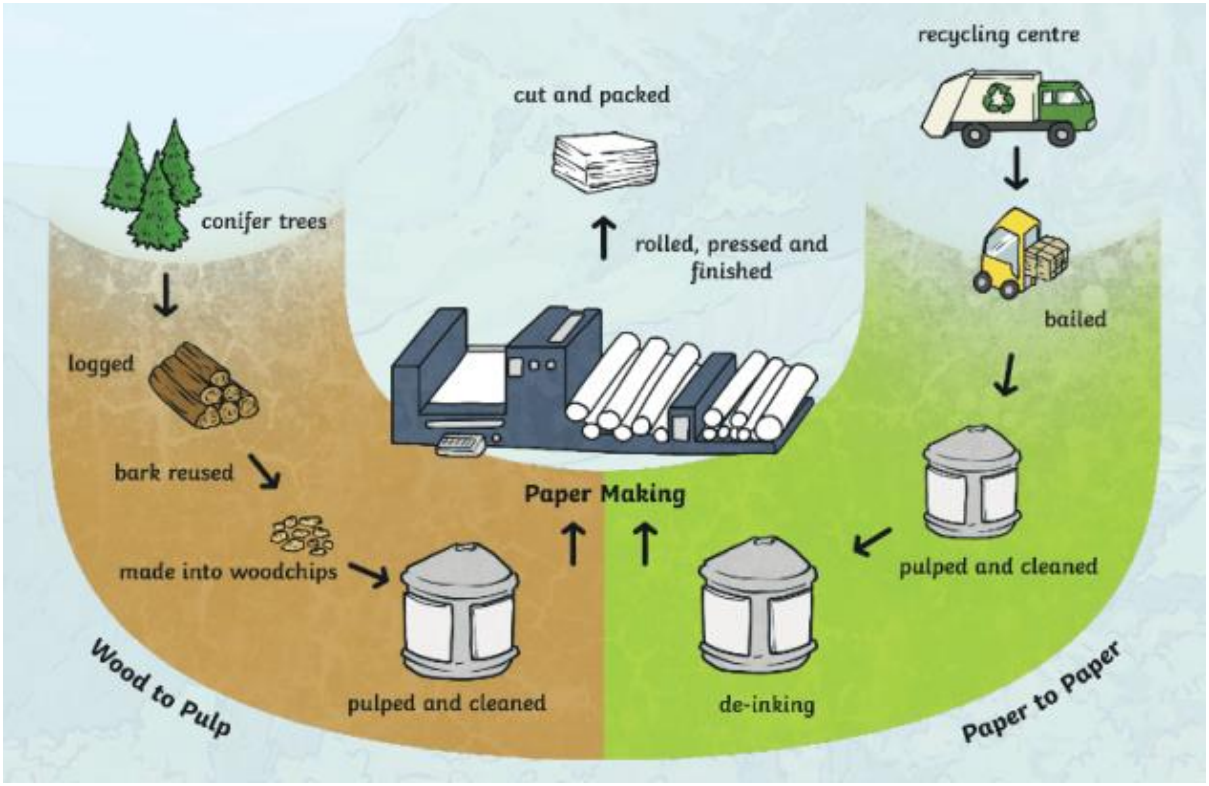
Visual Examples of Flow Charts

Here are some visual examples of flow charts, taken from Twinkl resources.



A flow chart of the RUCSAC (Read, Understand, Choose, Solve, Answer, Check) process for problem solving in Mathematics.

Flow chart used to determine whether something is living or non-living.



Flow chart showing the process of making paper, both from old recycled paper and from conifer trees.

How can I use flow charts in the classroom?

Flow charts are a useful way to get across potentially complex information about processes quickly and effectively. As such, they can be an incredibly useful teaching tool across multiple subjects.

Some suggestions for ways that you can use flow charts to enhance your lessons and make learning simpler include:

- Showing students how to do a science experiment.
- Mapping out story plots in literacy lessons.
- Demonstrating how to solve Maths problems.
- Showing your children how to go about classifying different plants and animals.
- Getting your children to think about how to achieve their goals.
- Helping your students write an essay, formal letter, poem, story and more.

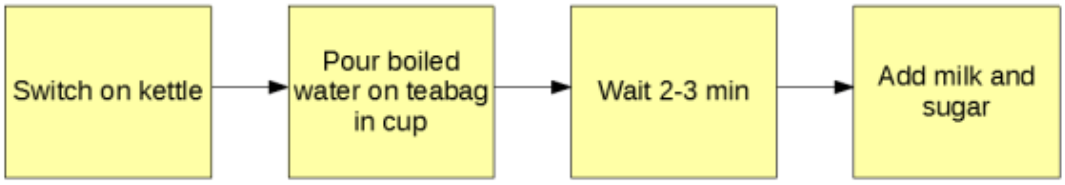
How to make your own flow chart template

If you are liking the idea of using flow charts in your classroom, you may be wondering what the best way is to go about it.

Creating a basic flow chart template is not at all complicated. All you need to do is draw up a series of squares or rectangles large enough to draw or write the relevant information into, then join the squares up with lines or arrows.

Flow charts should normally go left to right, top to bottom, but you can always use arrows to show the chart moving in a different direction, if you wish.

Here is a basic flow chart that demonstrates how to make a cup of tea:

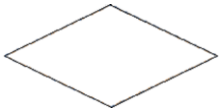


If, however, you would like to go into a little more detail with your flow chart template, you can also use different-shaped boxes to represent different types of steps in the process.

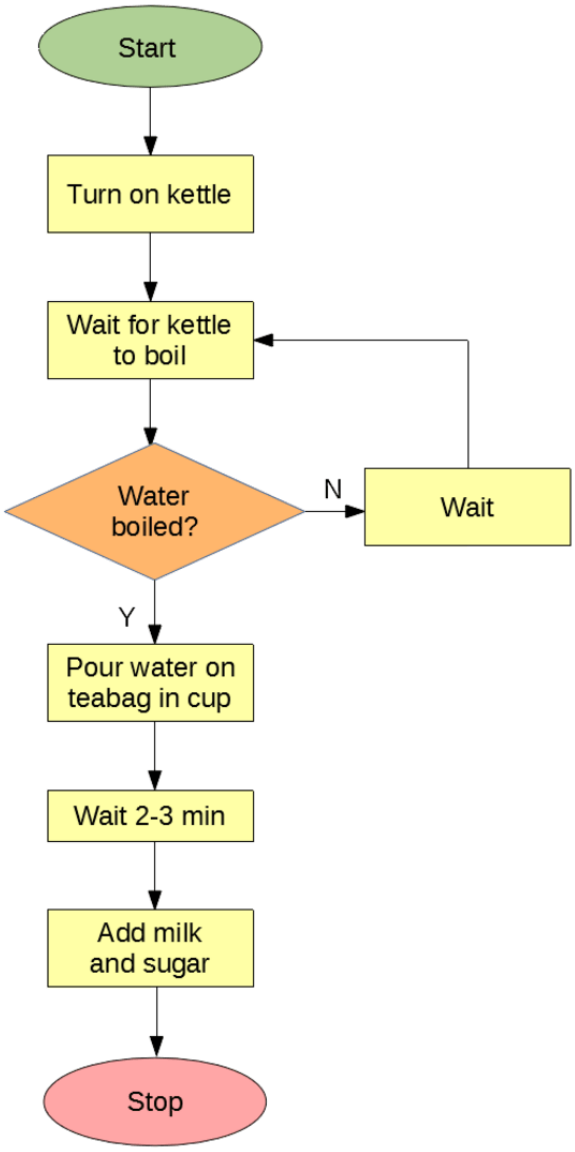
In fact, there is an internationally recognised standard of "building blocks" for flow charts, first devised by the American National Standards Institute (ANSI) in the 1960s, and last revised by the International Organization for Standardization in 1985. This flow chart template standard is often used in computer programming.

The current standard is known as ISO 5807, and the four most commonly-used symbols in this standard are as follows:

	Terminal	Used to indicate the start or end point of a process.
	Flowline	Used to indicate the order of operation. This can ei one end.

	Process	Used to show a step in the process.
	Decision	Used to show a conditional operation/step in the p down one of two or more paths based on the result o or true/false test or question.

With these additional flow chart template symbols, the process for making a cup of tea can now be demonstrated in more detail:



18.MINI PROJECTS

Project-based learning (**PBL**) is a student-centered pedagogy that involves a dynamic classroom approach in which it is believed that students acquire a deeper knowledge through active exploration of real-world challenges and problems.[1] Students learn about a subject by working for an extended period of time to investigate and respond to a complex question, challenge, or problem.[2] It is a style of active learning and inquiry-based learning. PBL contrasts with paper-based, rote memorization, or teacher-led instruction that presents established facts or portrays a smooth path to knowledge by instead posing questions, problems or scenarios

What is project as a method of teaching?

Project Based Learning is a teaching method in which **students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging**, and complex question, problem, or challenge.

In Project Based Learning, teachers make learning come alive for students.

Students work on a project over an extended period of time – from a week up to a semester – that engages them in solving a real-world problem or answering a complex question. They demonstrate their knowledge and skills by creating a public product or presentation for a real audience.

As a result, students develop deep content knowledge as well as critical thinking, collaboration, creativity, and communication skills. Project Based Learning unleashes a contagious, creative energy among students and teachers.

And in case you were looking for a more formal definition...

Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge.

10 Practical Ideas For Better Project-Based Learning In Your Classroom

By **Jennifer Rita Nichols**

Teachers are incorporating more and more projects into their curriculum, allowing for much greater levels of collaboration and responsibility for students at all levels. Project- based learning is a popular trend, and even teachers who don't necessarily follow that approach still see the benefit to using projects to advance their students' learning.

Projects can be wonderful teaching tools. They can allow for a more student-centred environment, where teachers can guide students in their learning instead of using lectures to provide them with information.

The increase in classroom technology also makes projects more accessible to students. Research no longer requires a trip to the library, and displaying information no longer requires a poster board. Instead, students can access endless amounts of information with a few clicks, and create all kinds of creative final products (such as slides, videos, cartoons, ebooks, blogs, websites, graphics, and much more).

Despite general agreement about the benefits of using projects and project-based learning in general, it must be noted that all projects are not created equal! It is quite possible to create projects that remove creative ability and control from the students and places all the power of decision with the teacher.

This may happen fairly often because teachers are wary about being able to assign grades to the final assignments handed in to them by students. If all students aren't given the same components to work on, with similar topics, and the same final layout to create, then how can the projects be accurately compared by the teacher? In short, they can't – *but also, they shouldn't!*

Students do not need to be compared against each other, but to the standards they need to achieve for their level. How each skill is demonstrated can differ from one student to another, yet each student can succeed nevertheless. A teacher who knows the program will know what skills each student needs to acquire, and present them with situations to help develop those skills. A teacher can also gauge whether a student has developed each skill regardless of the way they choose to create and present their project.

When students are engaged and interested in the work they are completing, the final product will be much better than when they feel forced to complete a task.

…but how can you make sure that the project you assign is engaging to as many students as possible – if not to all of them?

Here are some great tips to keep in mind when putting together your next project.

1) Have students work in small groups or pairs whenever possible.

Don't underestimate the power of collaboration. Working alone can be great at times to place a student's level of ability on their own, but it can be frustrating to a student when they run into parts that they are less adept at. Peer support can help keep things running smoothly, and also help students to build the skills that they are lacking by learning from each other.

If groups are too large, students are given the opportunity to shrink back and leave the work to others, but pairs or groups of three allows everyone to share input and really take on a role within the project. Don't be afraid of assessment from projects, you will be able to tell how each of your students are developing by maintaining a constant presence in your classroom and observing/interacting with your groups.

Being able to work together will definitely keep students more engaged in the work, especially since they become responsible to each other and to themselves for the completion of the project. There is less chance of students giving up or giving in mediocre work when they are being counted on by peers and are having fun.

2) Choose skills to be worked on instead of specific topics.

The goals of education focus on helping students to build the skills that they will need for their future. These skills involve being able to collaborate, write well, read between the lines, infer meaning, organize information, find solutions to problems, research effectively, and learn about their place in the world.

When forced into specific topics, students are limited in their ability to be creative and to focus on learning information that they find relevant to their lives. Instead of asking students to all complete projects on an animal, for example, why not decide on a few target skills and build a project guideline that can be used for many different topics instead? That way, students can focus in on something they would like to learn more about, while following your guidelines to make sure that the skills you are targeting are being developed.

If you want students to define a set of problems associated with something and work together to try to find plausible solutions to those problems, there is no need for every group to be working on exactly the same topic. This will also make things much more interesting when it comes time to present the projects, instead of listening to each student's version of the same thing!

3) Give students guidelines that allows for individuality.

After choosing the skills or content that you would like to be the focus of your project, build guidelines that support student individuality and creativity. Instead of making a list of specific questions with specific answers (such as 'what is the habitat of the grizzly bear' questions), lead students towards more open-ended answers in your guideline.

Using questions such as 'list three facts that you found surprising while researching the topic and explain why they surprised you', 'based on the information that you gathered, explain why you think ____ happens', and 'explain what the top ten things people need to know about your topic are in order to understand it well' can really lend themselves to multiple subjects.

Your guideline should list the skills that students are working on, so they are aware of them and can actively work on developing them. If you want students to learn about democracy and how the government works, as well as to develop their problem solving skills, then telling them to build their own country – similar to the USA or Canada in structure and government – but with their own flair added in, can be an engaging way to do it. Allow for some crazy bits included in their constitution, or even elections where voters submit to X-rays instead of bringing ID.

In order to complete the project, they will need to research the government you want, and take it even further by using the information as a basis for their own creations.

4) Encourage students to take on different roles while collaborating.

In order to get all students involved in a project, don't allow them to simply break it up and then put it back together after each student has individually covered a section of it.

Collaboration in the real world involves being able to work together on each part of a task, while learning to compromise and solve problems as they arise.

We rob our students of some great practice when we split tasks! Depending on the needs of the project, you can have graphic designers, managers, organizers, researchers, etc. While one student would be named 'in charge' of graphics, for example, they would still be working with the input of the rest of the team – much like how adults collaborate on projects in the 'real world'.

Encourage them to switch roles as needed, based on the strengths of their team, or on the skills each student needs to develop. No one student should always be 'in charge' or 'approving' all the work.

5) Allow students creative choice when it comes to the final result.

Do you really need that project to be presented on a piece of cardboard? If so, then make sure you have a good reason for it! There are so many ways for students to demonstrate learning, especially with the integration of technology, that it seems rather ridiculous to rob them of the chance to decide for themselves how to showcase their work.

What you really want is found in the content of the project, not in a piece of paper or cardboard. When students take ownership of the method of presentation, you are sure to be blown away with some extremely creative and innovative presentations. Allow them to make eBooks, videos, movies, animations, mind maps, skits, game shows, talk shows, newscasts, magazines, podcasts, blogs, or anything else they can come up with!

6) Change the way that projects are presented/displayed.

Even if every group in your class presents in a different way, you will be able to assess each and every one of the projects, based on the skills/content that students need to show you. Students will also look forward to presenting their project, and seeing the presentations made by others!

Also, instead of just pinning projects up on a board, or sending them right home after being presented, consider displaying them in more creative ways. Ebooks, articles, videos, and other media can be incorporated into a class website or blog, where other members of the community can access and appreciate the work.

If students know that their work will be shared online or in the school/community, they will likely be more excited about putting their best foot forward. When you know your work goes directly into the recycling bin once it's finished… well, less effort tends to go into it!

7) Grade projects based on the targeted concepts and skills.

Create grading rubrics or charts for yourself that help you to focus in on the specific skills that you are looking for in each project. Since each group may have a different final format, you won't be able to compare them with each other very well (which we shouldn't really do in general when assigning grades). Students are supposed to be graded on their level of development when compared to curricular goals, not based on comparisons with each other.

Try to avoid assigning grades based on how great one group's video was when compared with another group's poster board. While one might stand out more, the other may just have better content!

Letting students know exactly what you will be looking for beforehand will make it much easier for you to see what you need, as they will usually make sure to show it to you!

Besides, let's face it, if a university professor didn't explain exactly what was required of an assignment, but graded you based on what they were mysteriously looking for, you would be frustrated and have a hard time doing as well as you could in that class. *Our younger students appreciate the guidance too!*

8) Consider cross-curricular activities and/or work with another class.

Projects tend to be more engaging if students have the chance to immerse themselves in them as much as possible. Seeing similar content appear in multiple subject areas helps to reinforce what students are learning, as well as make the learning more relevant to them.

In many cases, mathematical or scientific learning can be added to English projects. History is another subject that lends itself well to cross-curricular projects.

Working with another class can also be fun for students. With today's technology, it is even possible for students to collaborate on projects with classes in other schools – or even in other countries. Doing this definitely helps to prepare students for their futures, as we often find ourselves working/collaborating with coworkers in other departments or cities. It can add an extra challenge to organizing work and getting things done efficiently!

9) Give the project a purpose beyond the classroom.

If possible, try to build connections to the outside world into projects. If students can work on something that will directly benefit the school or community (such as planning and implementing a fundraiser, or creating books/movies for a community centre or home, or even planning a special lesson for younger students) it can really help to build engagement in the class.

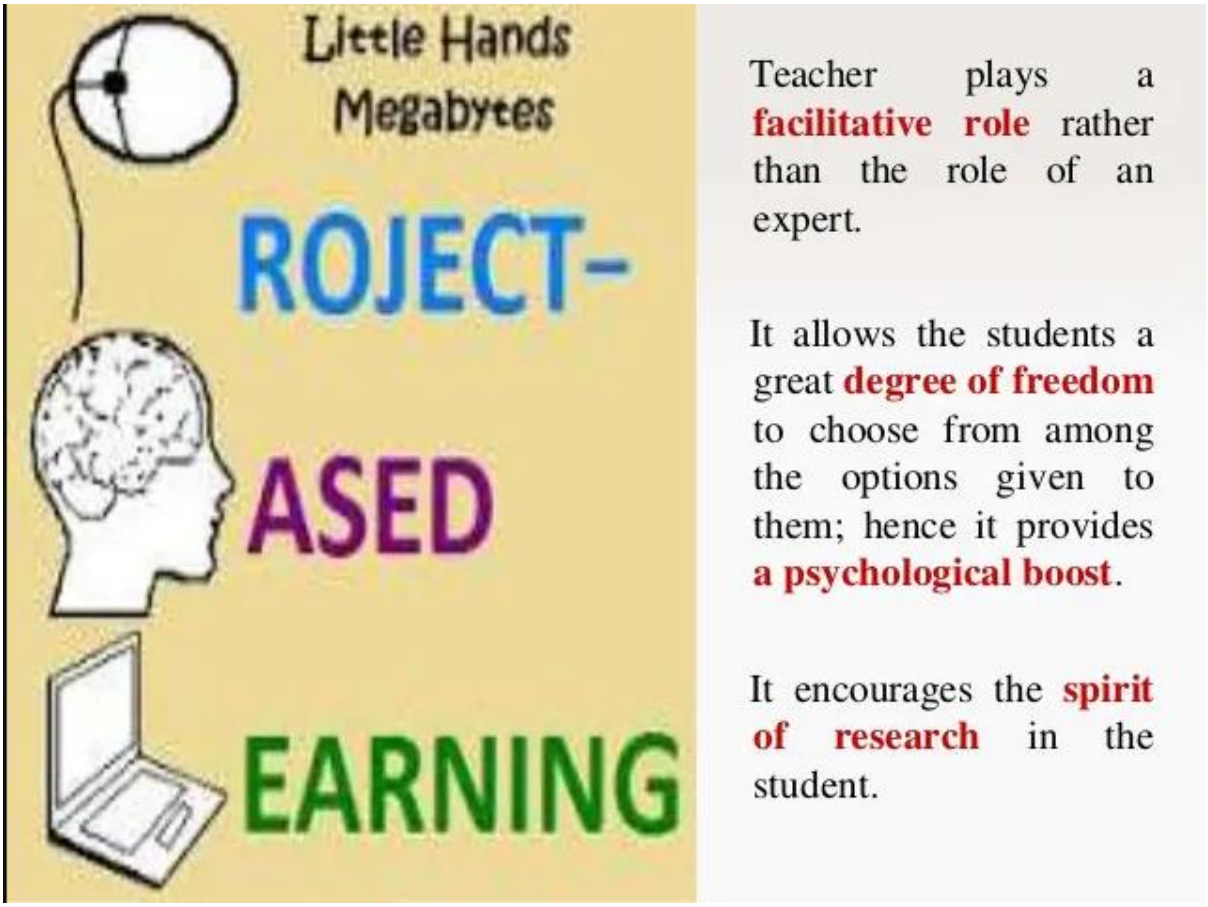
Knowing that your work will do more than get you grades – *that it will actually be used to help people* – can be a powerful motivator. Students will also help to motivate each other when they know that their work is important and useful.

10) Incorporate the project into the students' digital portfolios.

While not all projects can directly impact the community, they can at least be used as evidence of learning in students' working digital portfolios. The great thing about digital portfolios is that they follow a student as they advance through the grades and paint a picture of progress over time.

Once again, doing this can help curb the de-motivation of knowing that work will just be thrown away once completed. Incorporating student reflections and teacher/peer/parental/community feedback can also be a nice way to follow up on the learning that has taken place, as well as provide some future goals to work on in order to improve on skill development.

Beyond just tracking learning, the allure of being able to go and watch a video project you created years ago seems too good to pass up; I can remember a few of my own projects I wish I could see again!



19.SEMINARS

The seminar teaching method is a teaching model in which students work in small groups to discuss assigned questions and issues under the guidance of teachers.14-Aug-2020

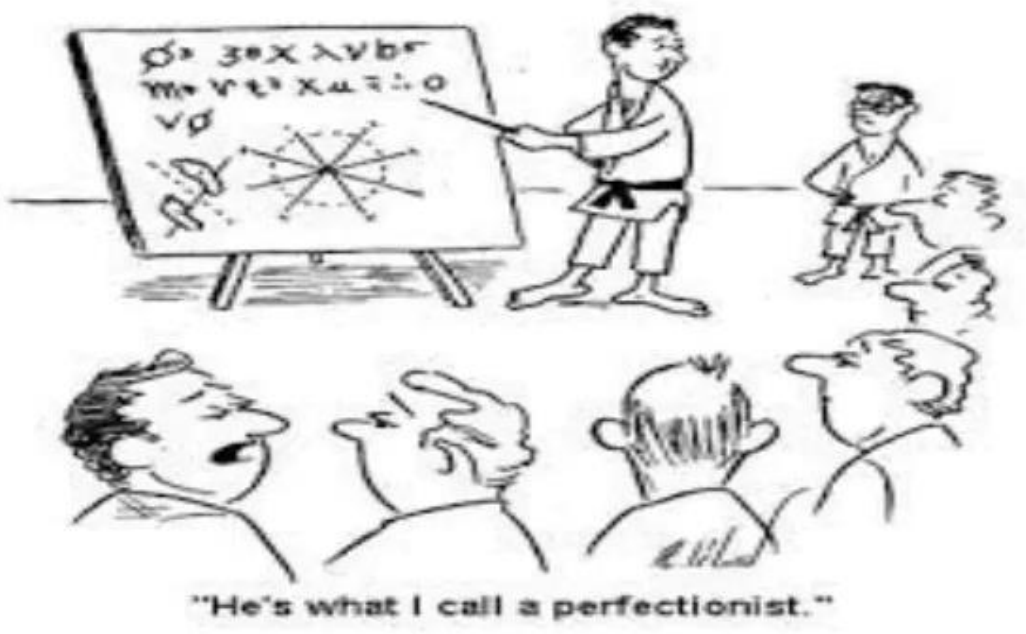
Practice points

- The meta-analysis revealed that the seminar teaching method was more effective in improving scores than lecture-based learning for medical students.
- There appears to be no difference in teaching basic concepts for students taught by seminar teaching methods or lecture-based learning.
- The effects of seminar teaching methods in practice courses were better than theory courses.

- In the seminar teaching method process, students take the initiative to preview the course content, find evidence and answers to questions assigned before course, share knowledge points with peers during the course. Traditional lecture-based learning is generally considered to induce passivity and compliance as it focuses on a one-way transfer of knowledge. The seminar teaching method, on the other hand, stresses on a multi-directional interaction between teachers and students or between students (Brown and Manogue 2001; Tricio et al. 2019). Engaging in previewing and preparing for courses helps improve the ability of students for knowledge collection and active learning is improved during engaging in previewing and preparing for courses. Students develop the quality of listening, questioning scientifically, debating with evidence, and collaborating during the discussion and communications (Novak 2002; Khosa et al. 2010). The seminar teaching method can help achieve the purpose of fully mastering knowledge points and improving learning scores (Kurczek and Johnson 2014; Spruijt et al. 2015).

- However, the seminar teaching method has some disadvantages, for example, it increases the learning burden, taking up too much spare time(Zhang and Shen 2011). Although the seminar teaching method has been widely used in medical education, there is no high-quality evidence like a systematic review or meta-analysis, suggesting that the seminar teaching method is superior to LBL. For these reasons Consequently, this meta-analysis aims to fill this gap by comparing the effects of the seminar teaching method and LBL in medical education.

SEMINAR



INTRODUCTION

A seminar is a group meeting (either face-to-face or online) where a number of students participateat least as actively as the teacher, although the teacher may be responsible for the design of thegroup experience, such as choosing topics and assigning tasks to individual students.Seminars can range from six or more students, up to 30 students in the same group. Because thegeneral perception is that seminars work best when numbers are relatively small, they tend to befound more at the graduate level or the last year of undergraduate programs.The seminar method is the most modern and advanced method of teaching. A seminar is anadvanced group technique which is usually used in higher education. It is an instructional techniqueit involves generating a situation for a group to have a guided interaction among themselves on atheme. It refers to a structured group discussion what usually follows a formal lecture or lecturesoften in the form of an essay or a paper presentation on a theme.The seminar, then, has two purposes. The first is to give an acquaintance with some of thedevelopments, problems, and points of view in legal education. The second is to force the members,each for himself, to make a useful synthesis of the field and to focus on the detailed treatment ofsome phase of it. To accomplish the first purpose we employ a reading list and the meetings of theseminar, led by other members of the faculty.The skills such as reading, writing and talking are essential for the personality development of aman. The seminar method integrates such skills of reading and writing with presentation skills.

AIMS & OBJECTIVES

This seminar method is employed to realise the higher objectives of cognitive & affective domains.The higher learning process requires the interactive and integrated methodologies based on the psychological principles. The seminar method applies

such technique of human interaction /intervention with the learning and teaching experiences.Cognitive objectives:
To develop higher cognitive abilities.
To develop the ability of responding in this manner would involve higher cognitive actions.
To develop the ability of keen observation of experience, feelings.
To develop the ability to seek clarification and defend the ideas of others effectively.Affective objectives:
To develop the feeling of tolerance to the opposite ideas of others.
To develop the feelings of cooperation with other colleagues and respect of the ideas and feelingsof others.
To develop the emotional ability among the participants of the seminar.
To acquire the good manners of putting questions and answering the questions of otherseffectively.
The human interaction under this technique develops the good manners and skills among the participants. Provide a good learning and scholastic experience to the participants of the seminar.
PRE-REQUISITES OF A SEMINAR
Pre-requisites (Basic Principles) to be included in the seminar:
•This seminar method depends with the lingual, social and emotional instances and its maturitylevel.
•The complex and undefined concept or article must be read and discussed for the me aningfullearning experiences and new concept.
•Group discussion is emphasised. The kernel of seminar is stressed. The value and success of theseminar depends on the path of the learner and their learning experiences through the discussion.The learner can advocate and interact in group discussion with his experiences and conceptderived. Both the group and learner can transform their ideas and to derive a new conclusion also be anticipated.
•
In the lower level of learning experiences the concepts are explanatory but in this higher level oflearning experience the theme or concept centred and need more evidences and explanationsthrough the discussion.
•The interactions in this method develop observation and questioning skills, evaluation skillsusing their own learning experience.Salient Feature of Seminar Method:
•This seminar method gives good motivation and learning experience.
•Help to evaluate the learning ability of learners.
•Regulate the creating and organising of facts and information.
•Dissemination and retrieval of information is scientifically managed.
•Develop the self reliance and self confidence.
•Also inculcates the responsibility and cooperative nature.
•This method is the best for socialisation/networking.
•Students' interaction is possible in participation and production of teaching learning process.
•Traditional monotony is abolished in this method.
•Ensures the understandability and enhances the capability of the students learning.
•Seminar is always subject / theme specific, so that sufficient knowledge about the concernedsubject can be developed.
•The presenter or the reader of the article can get further clarifications in his subject.

20.PROTO TYPE

A **prototype** is an early sample, model, or release of a product built to test a concept or process.[1] It is a term used in a variety of contexts, including semantics, design, electronics, and software programming. A prototype is generally used to evaluate a new design to enhance precision by system analysts and users.[2] Prototyping serves to provide specifications for a real, working system rather than a theoretical one.[3] In some design workflow models, creating a prototype (a process sometimes called **materialization**) is the step between the formalization and the evaluation of an idea.[4]

A **prototype** can also mean a typical example of something such as in the use of the derivation '**prototypical**'.[5] This is a useful term in identifying objects, behaviours and concepts which are considered the accepted norm and is analogous with terms such as stereotypes and archetypes.

Types[edit]

Prototypes explore different aspects of an intended design:[7]

- A **proof-of-principle prototype** serves to verify some key functional aspects of the intended design, but usually does not have all the functionality of the final product.[8]
- A **working prototype** represents all or nearly all of the functionality of the final product.[9]
- A **visual prototype** represents the size and appearance, but not the functionality, of the intended design. A **form study prototype** is a preliminary type of visual prototype in which the geometric features of a design are emphasized, with less concern for color, texture, or other aspects of the final appearance.[10]
- A **user experience prototype** represents enough of the appearance and function of the product that it can be used for user research.[11]
- A **functional prototype** captures both function and appearance of the intended design, though it may be created with different techniques and even different scale from final design.[12][13]
- A **paper prototype** is a printed or hand-drawn representation of the user interface of a software product. Such prototypes are commonly used for early testing of a software design, and can be part of a software walkthrough to confirm design decisions before more costly levels of design effort are expended.

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Characteristics and limitations of prototypes[edit]

A prototype of the Polish economy hatchback car Beskid 106 designed in the 1980s

Engineers and prototyping specialists seek to understand the limitations of prototypes to exactly simulate the characteristics of their intended design.

It is important to realize that by their very definition, prototypes will represent some compromise from the final production design. Due to differences in materials, processes and design fidelity, it is possible that a prototype may fail to perform acceptably whereas the production design may have been sound. A counter-intuitive idea is that prototypes may actually perform acceptably whereas the production design may be flawed since prototyping materials and processes may occasionally outperform their production counterparts.

In general, it can be expected that individual prototype costs will be substantially greater than the final production costs due to inefficiencies in materials and processes. Prototypes are also used to revise the design for the purposes of reducing costs through optimization and refinement.[15]

It is possible to use prototype testing to reduce the risk that a design may not perform as intended, however prototypes generally cannot eliminate all risk. There are pragmatic and practical limitations to the ability of a prototype to match the intended final performance of the product and some allowances and engineering judgement are often required before moving forward with a production design.

Building the full design is often expensive and can be time-consuming, especially when repeated several times—building the full design, figuring out what the problems are and how to solve them, then building another full design. As an alternative, rapid prototyping or rapid application development techniques are used for the initial prototypes, which implement part, but not all, of the complete design. This allows designers and manufacturers to rapidly and inexpensively test the parts of the design that are most likely to have problems, solve those problems, and then build the full design.

This counter-intuitive idea—that the quickest way to build something is, first to build something else—is shared by scaffolding and the telescope rule.

21.POSTERS

The Use of Posters in Education

Nelson Mandela claimed that "Education is the most powerful weapon which you can use to change the world". And he was absolutely right. A good education is the thing, which costs much efforts and often much money, but the results of which can be astonishing.

The degree plays not such an important role here. The key element of the education is knowledge and sometimes it's really hard to get it.Besides knowledge of some subjects, the education helps us to build our opinions and have our own points of view on different things. It doesn't only give us lessons, according to textbooks or the established programs, but provides us with the lessons of life.Many educational establishments and teachers work at the ways of making this process of getting knowledge easier and facilitate learning.Many programs, systems and approaches have already been created. In this article, we would like to discuss one of the elements of the modern education, used by many teachers.It's the use of posters during the educational process. Lets' consider the advantages of using them in the education, how and where they can be used and how to use them effectively.Advantages of using posters as a visual aid in the learning process are the following:It's an effective way to catch and hold the attention of pupils or students as well as maintain their interest in the subject.

- Posters can motivate students to learn a specific topic.
- They can help learners to focus on a certain idea, fact, event or process.
- They are convenient both for pupils and teachers as they help students to absorb the material faster.
- Images are more “evocative” than words and can lay the foundation of a variety of associations.
- 65% of people worldwide find learning most effective when it is transmitted visually and a poster is one of the best ways to do that.
- By having a poster in the classroom, you induce the students to constant learning, even if they just look around the classroom.

However, if you are a good teacher, you can't just take any illustration in the necessary theme and present it to your pupils. The success and the effectiveness of its usage depend upon the proper selection and correct utilization of this graphic element.

Here are some rules:

- The specific educational aim must be always taken into account while choosing and using a certain visual element.
- A good poster should have the following features:
    a. simplicity (its message must be understood at a mere glimpse of it);
    b. brevity (it needs to contain minimum of words, which are effectively presented);
    c. appropriateness (the theme of the image should correspond to the subject matter);
    d. attractiveness (it is necessary to capture the attention);
    e. design and color (a poster should be appropriate in its size, design and color: it should contain bright colors, be rather large so that everyone can see it).
- A teacher should do his or her best to help the students to pick up the message given by a particular poster and carry it in their thoughts.
- While choosing a poster, a teacher also needs think about the age of his or her pupils. It's pointless to use complicated schemes for boys and girls of 6. They will absorb the material faster if there are more bright pictures. In their turn, posters with childish pictures will be badly received by the high school students.
- It's also important that a poster inspire and motivate a pupil to learn more.

- A logical structure is crucial for an educational poster. It must have a logical sequence from the top to bottom so that your pupils won't get confused.
- Don’t use unnecessary images. The most important is the information.

Now, let's see in what kinds of classes posters can be used and consider the examples of their usage.

22.EXPERIMENTAL LEARNING

Background

Experiential learning is an engaged learning process whereby students "learn by doing" and by reflecting on the experience. Experiential learning activities can include, but are not limited to, hands-on laboratory experiments, internships, practicums, field exercises, study abroad, undergraduate research and studio performances.
Well-planned, supervised and assessed experiential learning programs can stimulate academic inquiry by promoting interdisciplinary learning, civic engagement, career development, cultural awareness, leadership, and other professional and intellectual skills.

Learning that is considered "experiential" contain all the following elements:

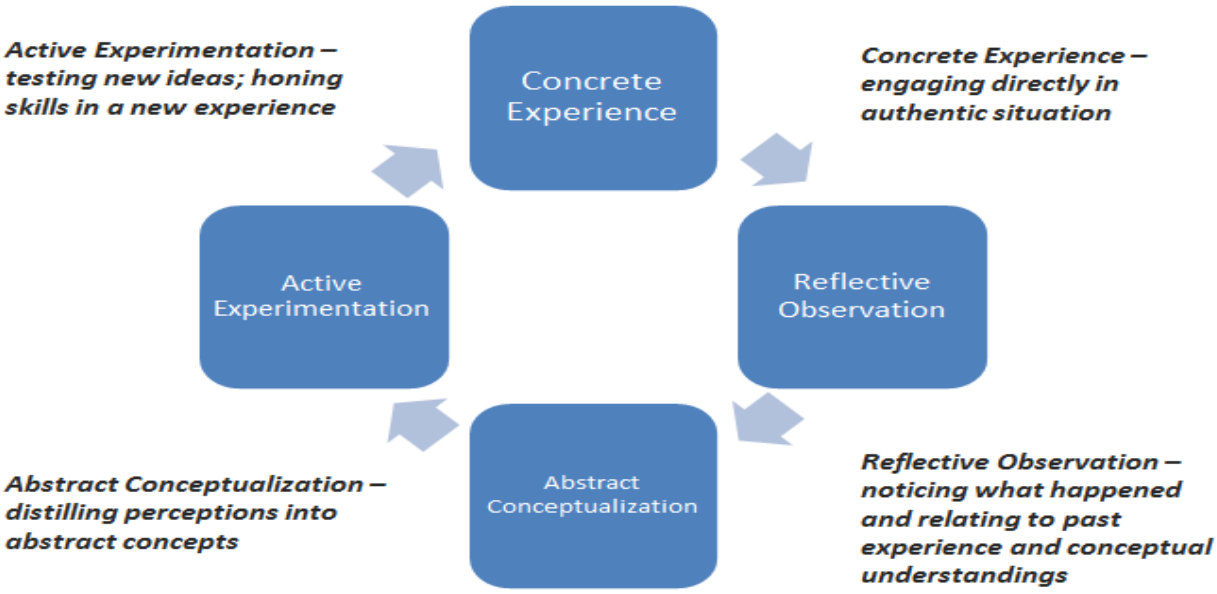
1. Reflection, critical analysis and synthesis.
2. Opportunities for students to take initiative, make decisions, and be accountable for the results.
3. Opportunities for students to engage intellectually, creatively, emotionally, socially, or physically.
4. A designed learning experience that includes the possibility to learn from natural consequences, mistakes, and successes.

How does it work?

Kolb's (1984) cycle of learning depicts the experiential learning process (see figure below). This process includes the integration of:

- knowledge—the concepts, facts, and information acquired through formal learning and past experience;
- activity—the application of knowledge to a "real world" setting; and
- reflection—the analysis and synthesis of knowledge and activity to create new knowledge" (Indiana University, 2006, n.p.).

Kolb's Cycle of Experiential Learning



What does experiential learning look like?

Experiential learning **has the following elements** (Association for Experiential Education, 2007-2014):

- Experiences are carefully chosen for their learning potential (i.e. whether they provide opportunities for students to practice and deepen emergent skills, encounter novel and unpredictable situations that support new learning, or learn from natural consequences, mistakes, and successes).
- Throughout the experiential learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning, and is challenged to take initiative, make decisions and be accountable for results.
- Reflection on learning during and after one's experiences is an integral component of the learning process. This reflection leads to analysis, critical thinking, and synthesis (Schon, 1983; Boud, Cohen, & Walker, 1993).
- Learners are engaged intellectually, emotionally, socially, and/or physically, which produces a perception that the learning task is authentic.
- Relationships are developed and nurtured: learner to self, learner to others, and learner to the world at large.

During experiential learning, **the faciltiators role is to**:

- Select suitable experiences that meet the criteria above.
- Pose problems, set boundaries, support learners, provide suitable resource, ensure physical and emotional safety, and facilitate the learning process.
- Recognize and encourage spontaneous opportunities for learning, engagement with challenging situations, experimentation (that does not jeopardize the wellbeing of others) and discovery of solutions.
- Help the learner notice the connections between one context and another, between theory and the experience and encouraging this examination repeatedly.

Some forms of experiential learning include (Indiana University, 2006; Moore, 2010):

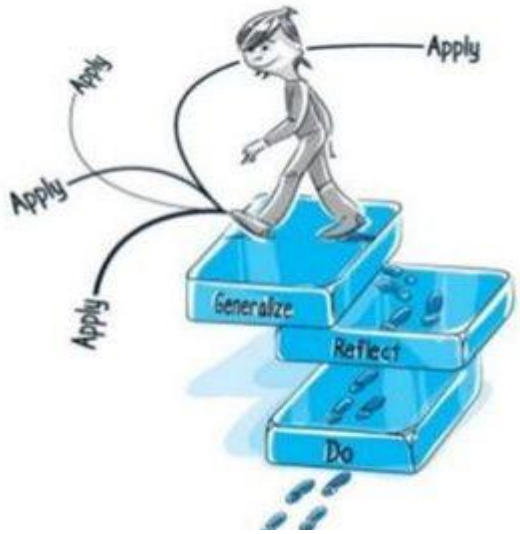
- **Internships** – A more broad term used to describe experience-based learning activities that often subsume other terms such as cooperative education, service-learning or field experiences. It is often a credit-bearing, free-standing activity in a student's field of interest not connected to a theoretical course. It is usually assessed by a faculty member and supervised by an employer who is not a faculty member. The student may work with practicing professionals, complete a project, attend public events, interview and observe constituents and employees. The student may or may not be paid for this experience. When attached to a classroom course, a student may spend several hours a week volunteering in an agency, supporting co-curricular activities, shadowing a professional in the field, or observing people in their natural environments. Key to this form of experiential learning is some type of guided reflection. The mission of this experience may be to support the integration of theory and practice, explore career options, or foster personal and professional development.
- **Service learning** – This term is used to denote optional or required out-of-classroom community service experiences/projects attached to courses or a separate credit bearing experience. The location may be the broader community outside the university or one embedded in co-curricular activities. In these experiences, students participate in an organized service activity that meets identified community needs and reflect on the service activity to better understand course content and gain a broader appreciation of the discipline and an enhanced sense of civic responsibility.
- **Cooperative education** – Mostly a part of professional programs, students gain practical relevant work experience over a period of multiple terms that intersperse their coursework. Students alternate work and study, usually spending a number of weeks in study (typically full-time) and a number of weeks in employment away from

campus (typically full-time). Alternatively, cooperative education may occur when students simultaneously attend classes part-time and work part-time during consecutive school terms in an intentionally planned and coordinated way. Students receive academic credit for cooperative education when the experiences meet the criteria for credit (i.e., faculty supervision, reflective components, evidence of learning). The purpose of these programs is to build student's career skills and knowledge.

- **Clinical education** – This is a more specifically defined internship experience in which students practice learned didactic and experiential skills, most frequently in health care and legal settings, under the supervision of a credentialed practitioner. It is often is a separate credit-bearing course tied to a related theoretical course or a culminating experience after a sequence of theoretical courses.
- **Student teaching** – This experience is specific to students in pre-professional and pre-service teacher education who are gaining required and evaluated experience in supervised teaching.
- **Practicum** – A relative of the internship, this form of experiential learning usually is a course or student exercise involving practical experience in a work setting (whether paid or unpaid) as well as theoretical study, including supervised experience as part of professional pre-service education.
- **Undergraduate research experience** – Students function as research assistants and collaborators on faculty projects.
- **Community-based research** – Faculty and students cooperate with local organizations to conduct studies to meet the needs of a particular community. Students gain direct experience in the research process.
- **Field work** – Supervised student research or practice carried out away from the institution and in direct contact with the people, natural phenomena, or other entities being studied. Field work is especially frequent in fields including anthropology, archaeology, sociology, social work, earth sciences, and environmental studies.
- **Study abroad** – Students usually engage in courses at higher education institutions in another country. The experiential learning component is the cultural immersion which provides novel challenges for navigating living in a new place. The coursework connected to a study abroad can also include internships and service-learning experiences.

Experiential Learning Methods

- ✓ Outbound Training
- ✓ Management Games
- ✓ Team Building Activities
- ✓ Adventure Based Learning
- ✓ Outdoor Learning Activities
- ✓ Drama, Art, Theatre
- ✓ Simulation Based Learning
- ✓ Film Making
- ✓ Story Telling
- ✓ Creativity Games
- ✓ Mystery Games
- ✓ Service Learning



TRADITIONAL LEARNING

Read a manual
Watch a video
Go to a seminar
Review case studies
5% retention rate

EXPERIENTIAL LEARNING

Immersive experiences
Themed challenges
Mirrors real life
Unique exercises
90% retention rate

Unlocking Insight.
CATALYST
Transforming Performance.

23.ROLE PLAYS

Role playing is a **learning structure that allows students to immediately apply content as they are put in the role of** a decision maker who must make a decision regarding a policy, resource allocation, or some other outcome.

Defining Role-Play

The Merriam-Webster dictionary (2019) has several definitions for the word 'role-play,' such as "to act out the role off," "to represent in action," and "to play a role". In education, several studies have had varying but similar definitions of role-play, ranging from calling it an experience to referring to it as a pedagogy (Agboola Sogunro, 2004; Hidayati & Pardjono, 2018; Radford & Stevens, 1988; Rao & Stupans, 2012; Westrup & Planader, 2013). Using the common themes between these definitions as a reference, role-play is defined in this chapter, as an instructional method where learners take on the responsibility of representing different character roles, within predefined, often realistic, scenarios

Components of Role-Play

A different approach to understanding role-play, is to examine the vocation of acting. Actors are required to act out scripts that contain lines representing characters in the story. Here we know it is the actor's responsibility to accurately convey the feelings and actions of the characters they are representing, but they must be guided by the director and the script. Can you imagine a movie or play that had random lines for the actors, with no connection or context between them? Much like acting, role-playing must include roles that learners can represent and a scenario that defines the context for the actions that role-players must take. Now you may find yourself asking, but what about the directors' influence?

The director is responsible for guiding and directing the actors to better connect with their roles. Similarly, role-play in education requires a guide or facilitator to work with the learners. A study conducted by Cobo et al. (2011) revealed that the addition of a guide or facilitator was necessary to maximize the benefits received from a role-play session. Another study using role-play discovered the importance of having mentors provide guidance to students during and after their role-play sessions (Nakamura et al., 2011). Taking these revelations and combining them with our definition for role-play, there are three major components needed to successfully implement role-playing: scenarios, roles/characters, and guides/facilitators.

Scenario

Continuing our movie example, the actors need to have a script that they can follow to better understand how to represent their characters. Similarly, role-play scenarios need to include relevant background information that will help establish the limitations, motivations, and the problems that learners will need to solve (Radford & Stevens, 1988). The problem should align with the content provided and be ill-structured to give students the flexibility to engage in critical thinking. For example, if the objective of the lesson is to teach manufacturing, then the theme of the scenario should relate to manufacturing, the roles/characters should be based around employees in manufacturing factories, and the problems, presented in the scenario, should relate to the theme. In terms of structure, the scenario should be detailed in areas that help define roles, context, and problems, but remain open ended about actions that can be taken by the roles/characters. This will give the learners a chance to dictate what actions need to be taken.

Roles/Characters

Much like scenarios, roles or characters need to be well defined, taking into consideration their expertise and limitations (Rao & Stupans, 2012). The roles should be based on the theme of the scenario and should be connected to the problems presented for the role-play session. For example, simply giving the learner a role of 'manager', will not be enough. The learner will need to know what the expertise of the manger is, what strategies they tend to use, and what position they hold in the company. Not knowing these parameters and limitations will reduce the effectiveness of the role-play, as learners will be able to give solutions that are outside the scope and expertise of the role they are representing. Additionally, if there is more than one role, then it is important to define the connection and relationship between the different roles. For example, the manner and method of communication between managers will be different than between a manager and an employee—making it important to define what the responsibility of each role is. Just imagine the chaos that would ensue if all movies were based on impromptu acting and had no defined roles for the actors.

Guides/Facilitators

If actors and scripts were enough for a movie to be successful, then there would be no demand for directors. The guides or facilitators in role-play sessions, have a similar role in providing direction to the learners. However, simply assigning an instructor to be a guide is not enough. To be effective, the guides or facilitators must prepare for the sessions in advance and have expertise on the relevant subject matters covered in the role-play sessions in order to answer player questions (Cobo et al., 2011; Radford & Stevens, 1988).

Significance of Using Role-Play in Education

Now that we have discussed what role-play is, let us see what value role-play has as an instructional method. Specifically, we are going to be looking at how role-play promotes active learning, positive player-to-player and player-to-instruction interaction, and increased student engagement and motivation. These elements provide significant value to the efficacy of using role-play in education.

Active Learning Approach

Role-play is considered as a possible method for achieving active learning (e.g., Bonwell & Eisen, 1991; Westrup & Planader, 2013). The active learning approach has been defined in several studies, across subject matters, as an approach that actively involves learners in their own learning process, letting the instructors act as guides and providing learners with opportunities to grow (Ghilhay & Ghilay, 2015; Graaf et al., 2005; Pekdoğan & Kanak, 2016). As learners engage in critical thinking—through representing characters and making decisions on how to advance through the scenario—they actively engage in their learning process. Also, putting the responsibility of learning in the hands of the learners provides them with more control over their own learning process. This kind of student-centric approach also leads to higher student engagement and participation (Bonwell and Eisen, 1991; Howell, 1992).

Increased Learner Engagement and Motivation

One of the main goals for any instructional method is to improve the effectiveness of instruction, leading to higher student performance and satisfaction. Cobo et al.'s (2011) research revealed that using role-play, in engineering studies, had a positive impact on learner engagement and motivation. They noted that the students were answering emails even outside

of designated class time, which was contrasted with the authors' previous experiences that showed decrease in student engagement outside of class. In another study Agboola (2004) discovered that after applying role-play in education leadership courses, students showed increased interest in students, which led to an increase in their understanding of the content of the course. Both studies indicate that role-play has a positive correlation between its use and an increase in student engagement and motivation across subject matters.

Increased Interaction Between Learners

Another important aspect involved in role-play is the interactions between the learners and the instructors. The interactions can take place as discussions, debates or even casual conversations, allowing the learners to observe each other during the session. This level of interaction helps develop a sense of community between the learners in the session and provide opportunities to practice communicating in various social contexts (Ladousse, 1987). Role-play interaction also aligns with Bandura's (1977) social learning theory, whereby learners increase their motivation towards actions they observe other learners making.

Considerations

Before we talk about implementation, it is important to keep some things in mind when considering role-play as an instructional method. These considerations include the amount of time required for role-play sessions, management of the level of complexity of the problem and scenario, and the increased workload for the facilitators. It is imperative to plan for these considerations before initiating role-play.

Time Requirement

One scenario for role-play has the potential to last for several weeks, depending on how many problems are introduced, or how much time is allotted for each session. Learners can also take several sessions to acclimate to the idea of role-playing their characters (Radford & Stevens, 1988). Extra care must be taken in determining how much time is available when considering using role-play in classrooms.

Level of Complexity

The open-ended nature of role-play allows each session and scenario to be tailored to the needs of different demographics of learners, regardless of age or expertise in role-playing. However, it is important to recognize the difference between children, adults, novice, and expert learners when it comes to the level of complexity they can handle. For example, a study by Radford and Stevens (1988) revealed that undergraduate students new to role-play had difficulty participating in the sessions but got more comfortable over the next few sessions. A study by Nakamura et al. (2011) showed that novice learners tended to 'stick to the script', and not deviate or explore during the sessions. This was a problem as the script was only meant to guide the learners, and exploration was required to fully engage with the content. This prompted them to introduce experts, to facilitate the session, for each group. The experts were able to provide opportunities for the learners to deviate and explore the scenario, which maximized the effectiveness of each session. Taking this into account it is important to recognize the demographic of the learners that will be participating and designing the role-play sessions, with appropriate complexity to match them. For example, novice audiences will require more scaffolding and guidance, when compared to learners who have experience in role-playing.

Increased Workload for Instructors/Facilitators

Role-play sessions tend to increase the workload for the facilitators and are difficult to prepare for and conduct (Nakamura et al., 2011; Radford & Stevens, 1988). The higher the player count, the more difficult it is to facilitate the session. The nature of role-play also requires the facilitators to respond to prompts quickly, as learners run the risk of being waylaid or stuck during the session, lowering its effectiveness (Nakamura et al., 2011). Implementing role-play successfully will require instructors to be thorough with their preparation, and account for the increase in student questions. Instructors may also need to seek assistance with facilitating the sessions.

Implementing Role-Play: How to Use Role-Play for Learning

To create a successful role-play session, it is important to establish the problem you want learners to solve, the theme for the scenario that best fits the problem, and the total time you want to allocate to the session. Determining these factors will provide a solid foundation for creating the session. The time limit will gauge the level of complexity that the problem can have, while keeping the theme and problem connected will make it easier to create roles/characters that fit. The last step will be implementation, where the session will need to be in a location that has enough room for the participants to be close enough to comfortably communicate with each other and the instructor. The checklist created by Howell (1992) provides more details on how to set up and prepare for a role play session. Two examples, one for corporate education and one for higher education, on implementing role-play have been provided below.

Worked Example: Training to Teach Safety in the Workplace

Below is an example of the steps to take to implement a role-play session for a training to teach workplace safety:

1. Problem. Determine what the underlying problem is. What are you trying to train? In this case it will be about workplace safety.
2. Scenario. Include details about the internal and external workplace environment, location, culture, roles/characters, and other relevant information. For this situation, be sure to include current safety policies, any issues associated with them, their effectiveness/importance, and other additional safety measures that you want your learners to know. Common safety policies include having emergency safety equipment—such as fire retardant on hand—and ensuring there is always adequate ventilation and heating in the workplace.
3. Roles/Characters. Provide details that include motivation, job title, expertise and limitations. Be sure to connect the roles to the theme, problem, and to each other. The main characters here should be employees, managers, and human resources representatives. An example description of an employee can be Jill, who has been working in this company for 4 years. She is well liked and receives good reviews from her supervisor. Jill has complained in the past that some of the policies are confusing and difficult to remember.
4. Total time. Determine the maximum time allotted per session. Adjust the problem, lowering or increasing complexity, depending on available time. Time limit will be determined by company policy, and the time allowed for professional development. An average good time might be 2 hours a week, per session, for a month.
5. Provide materials, such as the scenario and relevant subject matter information, to the learners. Make sure all learners understand the concept of role-playing, are aware of the scenario, and the roles assigned to them at the start of each session. In this case,

learners should be assigned the roles of employees and manager. The role of human resource representative should go to the facilitator of the training.

6. Location. Select an appropriately sized location that can hold participants and other observers. The participants must be allowed to comfortably communicate with each other. In this case you can use a large conference room or an outside location that can host the required number of stakeholders.

Worked Example: Teaching Marketing Principles Using Role-Play

Below is an example of the steps to take to implement a role-play session teaching marketing principles:

1. Problem. Determine what the underlying problem is. What are you trying to teach? What are the objectives of the lesson? In this case, it will be about teaching marketing principles, which can include topics such as the 4 *P*s of marketing or target audience analysis.
2. Scenario. Include details about the environment, background for the characters, location, culture, details about the roles/characters, and other relevant information. For this example, the focus should be on creating a relatable background such as a new marketing project being started in a business. Details, such as the name of the business, the location, work culture, and product lines, should be provided.
3. Roles/Characters. Provide details that include motivation, job title, expertise and limitations. Be sure to connect the roles to the theme, problem, and to each other. The main characters here should be marketing employees, manager(s), and team leader(s). A possible description for marketing employee could be Mark, who has 3 years of working experience in marketing, and he specializes in target market analysis. He is a hard worker, gets good reviews, and aspires to lead his own team for marketing projects. Unfortunately, Mark has trouble communicating with his peers, and often has difficulty articulating his ideas.
4. Total time. Determine the maximum time allotted per session. Adjust the problem, lowering or increasing complexity, depending on available time. Time limit will be determined by the total course time, time allotted in the course for assignments, and the frequency of the sessions, per week. An average good time might be one session a week for 50 minutes.
5. Materials. Provide materials such as the scenario and relevant subject matter information to students and assign roles. Make sure all students understand the concept of role-playing, and are aware of the scenario and the roles assigned to them at the start of each session. In this case, students should be assigned the roles of marketing employees, with the instructor being assigned team leader or manager.
6. Location. Select an appropriately sized location that can hold participants and other observers. The participants must be allowed to comfortably communicate with each other. In this case, a classroom setting will work. However, depending on the number of students, the seating structure of the classroom may need to be adjusted.

ROLE PLAYS

USES	ADVANTAGES	DIS-ADVANTAGES
• Exploring and improving interviewing techniques and examining complexities and potential conflicts of groups. • To consolidate different lessons in one setting.	• Good energizers. • Promotes empathy of trainees for other situation. • Encourages creativity in learning.	• Participants might be reluctant. • May not work with trainees who do not know each other well.

24. PROBLEM-BASED LEARNING

Problem-based learning (PBL) is a student-cantered approach in which students learn about a subject by working in groups to solve an open-ended problem. This problem is what drives the motivation and the learning.

Why Use Problem-Based Learning?

Nilson (2010) lists the following learning outcomes that are associated with PBL. A well-designed PBL project provides students with the opportunity to develop skills related to:

- Working in teams.
- Managing projects and holding leadership roles.
- Oral and written communication.
- Self-awareness and evaluation of group processes.
- Working independently.
- Critical thinking and analysis.
- Explaining concepts.
- Self-directed learning.
- Applying course content to real-world examples.
- Researching and information literacy.
- Problem solving across disciplines.

Considerations for Using Problem-Based Learning

Rather than teaching relevant material and subsequently having students apply the knowledge to solve problems, the problem is presented first. PBL assignments can be short, or they can be more involved and take a whole semester. PBL is often group-oriented, so it is beneficial to set aside classroom time to prepare students to work in groups and to allow them to engage in their PBL project.

Students generally must:

- Examine and define the problem.
- Explore what they already know about underlying issues related to it.
- Determine what they need to learn and where they can acquire the information and tools necessary to solve the problem.
- Evaluate possible ways to solve the problem.
- Solve the problem.
- Report on their findings.

Getting Started with Problem-Based Learning

- Articulate the learning outcomes of the project. What do you want students to know or be able to do as a result of participating in the assignment?

- Create the problem. Ideally, this will be a real-world situation that resembles something students may encounter in their future careers or lives. Cases are often the basis of PBL activities. Previously developed PBL activities can be found online through the University of Delaware's PBL Clearinghouse of Activities.
- Establish ground rules at the beginning to prepare students to work effectively in groups.
- Introduce students to group processes and do some warm up exercises to allow them to practice assessing both their own work and that of their peers.
- Consider having students take on different roles or divide up the work up amongst themselves. Alternatively, the project might require students to assume various perspectives, such as those of government officials, local business owners, etc.
- Establish how you will evaluate and assess the assignment. Consider making the self and peer assessments a part of the assignment grade.

n a problem solving method, **children learn by working on problems**. This enables the students to learn new knowledge by facing the problems to be solved. The students are expected to observe, understand, analyze, interpret find solutions, and perform applications that lead to a holistic understanding of the concept.

Problem-Based Learning (PBL) is a teaching method in which complex real-world problems are used as the vehicle to promote student learning of concepts and principles as opposed to direct presentation of facts and concepts. In addition to course content, PBL can promote the development of critical thinking skills, problem-solving abilities, and communication skills. It can also provide opportunities for working in groups, finding and evaluating research materials, and life-long learning (Duch et al, 2001).

PBL can be incorporated into any learning situation. In the strictest definition of PBL, the approach is used over the entire semester as the primary method of teaching. However, broader definitions and uses range from including PBL in lab and design classes, to using it simply to start a single discussion. PBL can also be used to create assessment items. The main thread connecting these various uses is the real-world problem.

Any subject area can be adapted to PBL with a little creativity. While the core problems will vary among disciplines, there are some characteristics of good PBL problems that transcend fields (Duch, Groh, and Allen, 2001):

- The problem must motivate students to seek out a deeper understanding of concepts.
- The problem should require students to make reasoned decisions and to defend them.
- The problem should incorporate the content objectives in such a way as to connect it to previous courses/knowledge.
- If used for a group project, the problem needs a level of complexity to ensure that the students must work together to solve it.
- If used for a multistage project, the initial steps of the problem should be open-ended and engaging to draw students into the problem.

The problems can come from a variety of sources: newspapers, magazines, journals, books, textbooks, and television/ movies. Some are in such form that they can be used with little editing; however, others need to be rewritten to be of use. The following guidelines from The Power of Problem-Based Learning (Duch et al, 2001) are written for creating PBL problems

for a class centered around the method; however, the general ideas can be applied in simpler uses of PBL:

- Choose a central idea, concept, or principle that is always taught in a given course, and then think of a typical end-of-chapter problem, assignment, or homework that is usually assigned to students to help them learn that concept. List the learning objectives that students should meet when they work through the problem.
- Think of a real-world context for the concept under consideration. Develop a storytelling aspect to an end-of-chapter problem, or research an actual case that can be adapted, adding some motivation for students to solve the problem. More complex problems will challenge students to go beyond simple plug-and-chug to solve it. Look at magazines, newspapers, and articles for ideas on the story line. Some PBL practitioners talk to professionals in the field, searching for ideas of realistic applications of the concept being taught.
- The problem needs to be introduced in stages so that students will be able to identify learning issues that will lead them to research the targeted concepts. The following are some questions that may help guide this process:
    - What will the first page (or stage) look like? What open-ended questions can be asked? What learning issues will be identified?
    - How will the problem be structured?
    - How long will the problem be? How many class periods will it take to complete?
    - Will students be given information in subsequent pages (or stages) as they work through the problem?
    - What resources will the students need?
    - What end product will the students produce at the completion of the problem?
- Write a teacher's guide detailing the instructional plans on using the problem in the course. If the course is a medium- to large-size class, a combination of mini-lectures, whole-class discussions, and small group work with regular reporting may be necessary. The teacher's guide can indicate plans or options for cycling through the pages of the problem interspersing the various modes of learning.
- The final step is to identify key resources for students. Students need to learn to identify and utilize learning resources on their own, but it can be helpful if the instructor indicates a few good sources to get them started. Many students will want to limit their research to the Internet, so it will be important to guide them toward the library as well.

The method for distributing a PBL problem falls under three closely related teaching techniques: case studies, role-plays, and simulations. Case studies are presented to students in written form. Role-plays have students improvise scenes based on character descriptions given. Today, simulations often involve computer-based programs. Regardless of which technique is used, the heart of the method remains the same: the real-world problem.