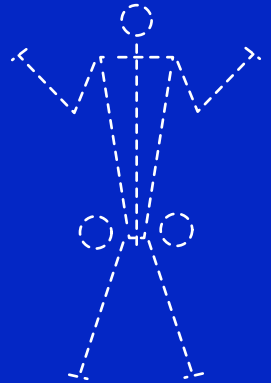




Learning Design Guide



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Preface

The guide bases its approach for Learning Designers on developing digital instructional materials grounded in global course design principles and practices contextualised to tribal and indigenous communities. It distills the best practices to achieve learner engagement and establish an equilibrium between traditional classroom teaching and digital education in Nagaland with empathy as the cornerstone.

Developing a curriculum that is relevant, interesting, and engaging for the students while at the same time valuing their knowledge, lived experiences and traditional skills is crucial as students learn best when the learning is situated in their context. It is also important to note that the curriculum of every subject evolves continuously as new concepts, ideas, methods, and tools are introduced to the learner's needs change.

All students no matter their age learn differently and teaching methods should reflect this, by designing teaching programs in a way that reaches visual, auditory, and kinetic learners alike. Hence, it is essential to use the right pedagogical practices for the learning context. Course development is an iterative process of continual refinement through feedback loops and checks for congruency and alignment across components of a module or educational program. Through this, educators and students will have the opportunity to develop their knowledge in line with their own learning goals and expectations.

01 NagaEd design approach, methodology, and application

1.1 Blended Learning and NagaEd Learning Management System (LMS)

Blended learning

NagaEd helps bridge the gap between traditional practice and innovative teaching and learning so that students may benefit from both. We are redefining traditional educational roles by merging physical and digital learning spaces to complement one another.

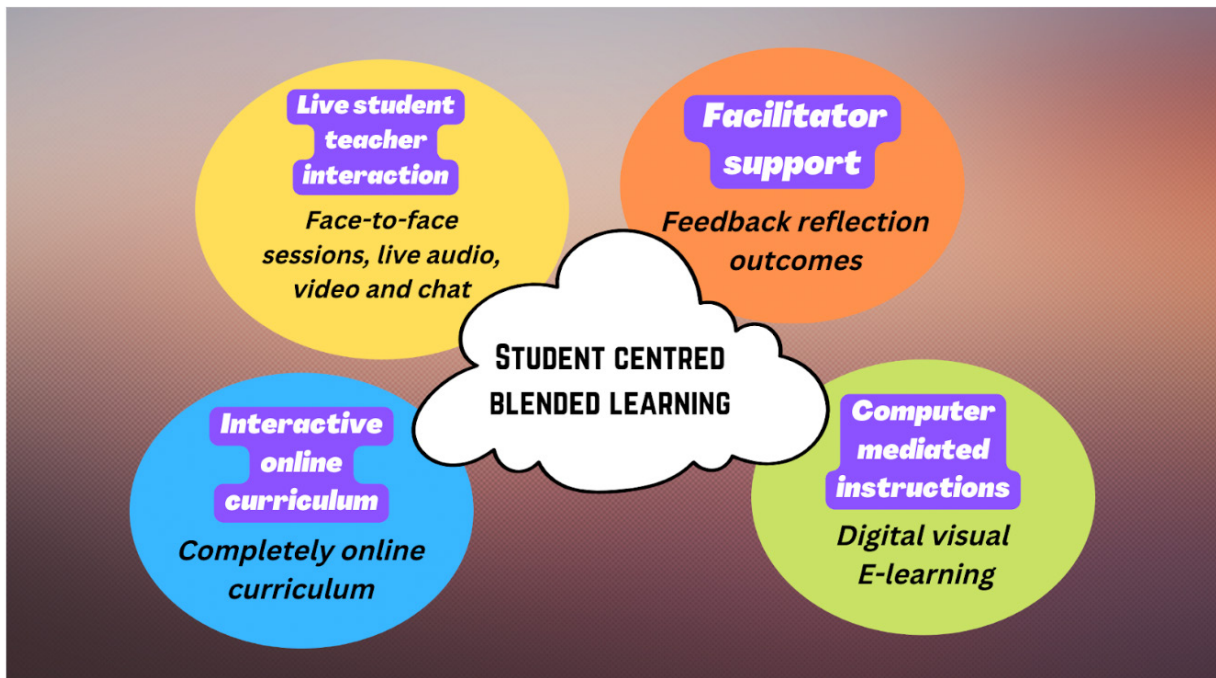


Fig 1. Blended learning
(Source: Xspace, Blended-learning & flipped classroom)

Traditional Classroom vs NagaEd Blended Learning

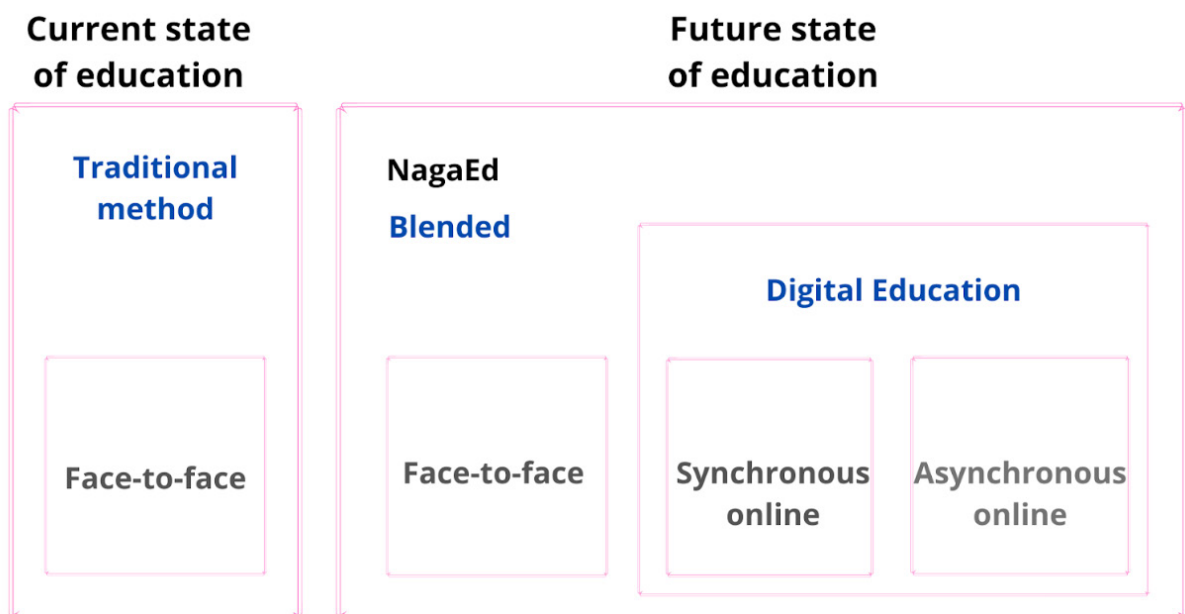


Fig 2. Comparison between traditional teaching against NagaEd design approach and methodology.

The traditional education system in Nagaland does not serve the needs of the current generation, much less the demands of the next. It mostly relies on repetition and rote memorization which prevents students from honing their critical thinking, problem-solving, and decision-making abilities. The National Education Policy, 2020 in chapter 24, (24.6) of clause (i) stated “Blended models of learning: While promoting digital learning and education, the importance of face-to-face in-person learning is fully recognized. Accordingly, different effective models of blended learning will be identified for appropriate replication for different subjects” (NEP. 2020). Thus, NagaEd is committed to preparing students for a technology-driven world to transform the traditional education system into a newer and more flexible version that is robust and agile.

With the introduction of blended learning, we shift classroom teaching from being mostly teacher-directed, top-down, and one-size-fits-all to being more student-driven, bottom-up, and individualized (UGC, 2021). We enable teachers to yield more frequent and more personal teacher interaction with individual students and have the opportunity to deepen and strengthen student/teacher relationships. While online instruction which offers two modes of delivery, i.e., synchronous and asynchronous, will allow students the opportunity and flexibility over their learning and help them develop self-reliance.



Blended learning is an approach that combines face-to-face interactions between students and teachers at school, with technology-supported learning opportunities at home and/or at school to improve the quality of education.



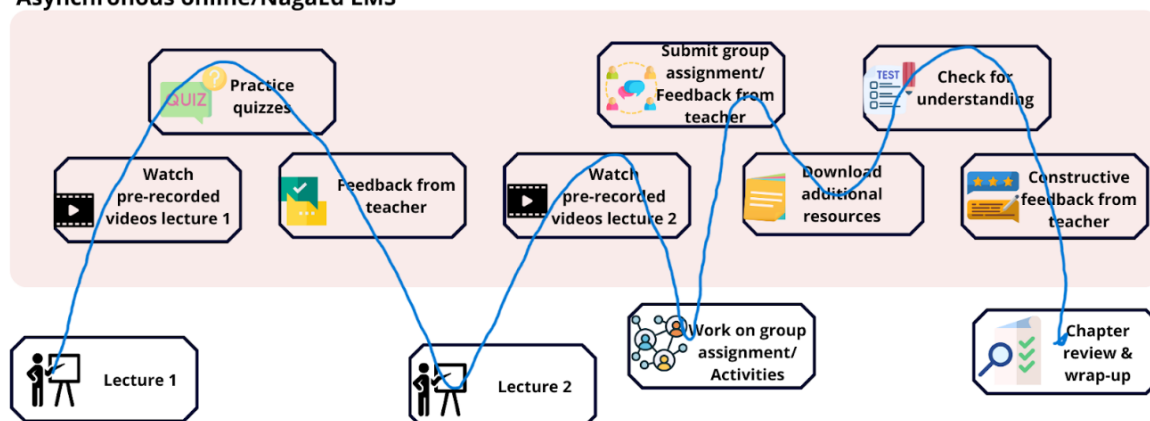
NagaEd Learning Management System (LMS)

To expand the boundaries of learning, NagaEd deploys a learning management system (LMS) and gives students the best 21st-century learning experience possible. Our flexible online platform can support teachers by incorporating both synchronous (live or in real-time) and asynchronous (pre-recorded or self-paced) methods of delivery in their course design. With our LMS and its features, students have emails, discussion groups, and audio discussion presentations to cultivate positive interactions, and they navigate to one location to accomplish all of their work.

Application

Considering the traditional learning and education system in Nagaland, there is a restriction on time and place which burdens the learner to satisfy the learning environment. To solve the barriers to learning we blend traditional face-to-face teaching and learning with asynchronous digital. It provides an opportunity for teachers to seamlessly integrate asynchronous blended learning elements into their coursework to transform and improve the learning process. Our strategy is to enhance student engagement and learning through digital activities in the course curriculum and improve effectiveness and efficiency by reducing lecture time in the classroom with student-centred activities and hands-on learning for students.

Asynchronous online/NagaEd LMS



Traditional face-to-face

Fig 3 Application example of traditional face-to-face teaching with NagaEd asynchronous digital

NEP 2020 policy under its principles stated: “The extensive use of technology in teaching and learning” (NEP, 2020). It is important that the right mix supports the student's learning journey in the best possible way and leaves enough room for individualization and focus on the learner. With the traditional teaching paradigm, teachers teach course material during class time through passive lectures or demonstrations. The traditional lecture delivery often gives students too much information to memorize. Students are then assigned homework to evaluate or analyze the information they learned during class time.

The optimal way is to mix the flexibility and convenience of asynchronous learning with interaction through face-to-face learning. As the figure above shows, student-centred learning is reinforced by presenting concepts in a simplified way and engaging in class-wide discussions. Prior to group assignment submissions, groups facilitate discussion in class. Keep in mind that an effective group discussion will involve all participants, so make sure to draw out everyone's opinion by encouraging quiet participants to share. This will offer ways for students to assess their own understanding of course concepts. With asynchronous course delivery, provide pre-recorded videos from reliable sources, practice quizzes, and additional resources, where students can review these materials at home and at their own pace. Build in checkpoints to ensure students are mastering the content you have presented in your modules. These checkpoints can be online quizzes, performance-based assignments, checking for understanding, etc with constructive feedback.

1.2 Bloom's Taxonomy

NEP in the fundamental principles stated “creativity and critical thinking to encourage logical decision-making and innovation” (NEP, 2020). A holistic assessment of students can be achieved by the use of the six levels of Bloom as a benchmark as suggested in NEP. Bloom's taxonomy provides a framework for cognitive behaviours which can be applied to understand the difficulty of tasks, conduct an assessment, and simplify or complicate the activities. It guides teachers to change the complexity of the questions and helps students to achieve higher levels of hierarchy. Further, it helps to develop critical thinking among teachers.

Beyond testing students on their ability to memorize content, NagaEd hopes to educate students to become critical thinkers, creators, and researchers. To do this, we refocus on the lower levels of Bloom to strengthen their foundation of knowledge. Through technology, we are optimizing lower-order thinking skills and improving the teaching capacity to prepare students to master their knowledge and advance to the next level.

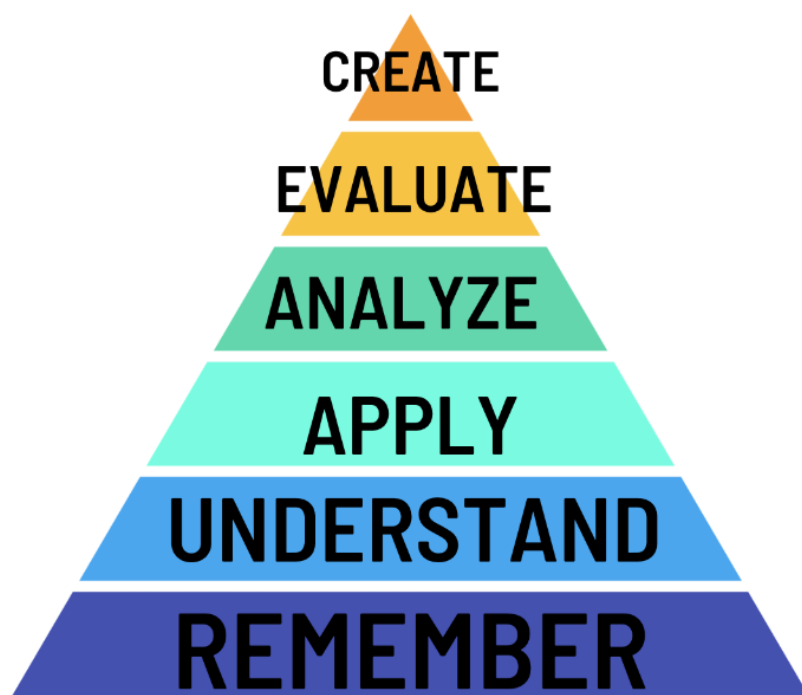


Fig 4. Bloom's revised taxonomy (Source: Creatrix campus, Bloom's taxonomy, Mary Clotilda)

The various learning levels from Bloom's Taxonomy are considered to help teachers match their assessment with the different levels of learning objectives in order to determine the learners' behaviour.

Bloom's digital taxonomy

Bloom's Digital Taxonomy is an extension of Bloom's Taxonomy and provides a useful framework for designing learning activities in a digital environment. The purpose of Bloom's Digital Taxonomy is to guide teachers on how to use technology and digital tools to facilitate technology-rich learning experiences for students. However, the use of this adapted version and the examples of tools it provides focus should not be on the tools themselves, but rather on how the tools can act as vehicles for transforming student thinking at different levels. Outlined below are the levels featured within Bloom's Revised Taxonomy (Sneed, 2016).

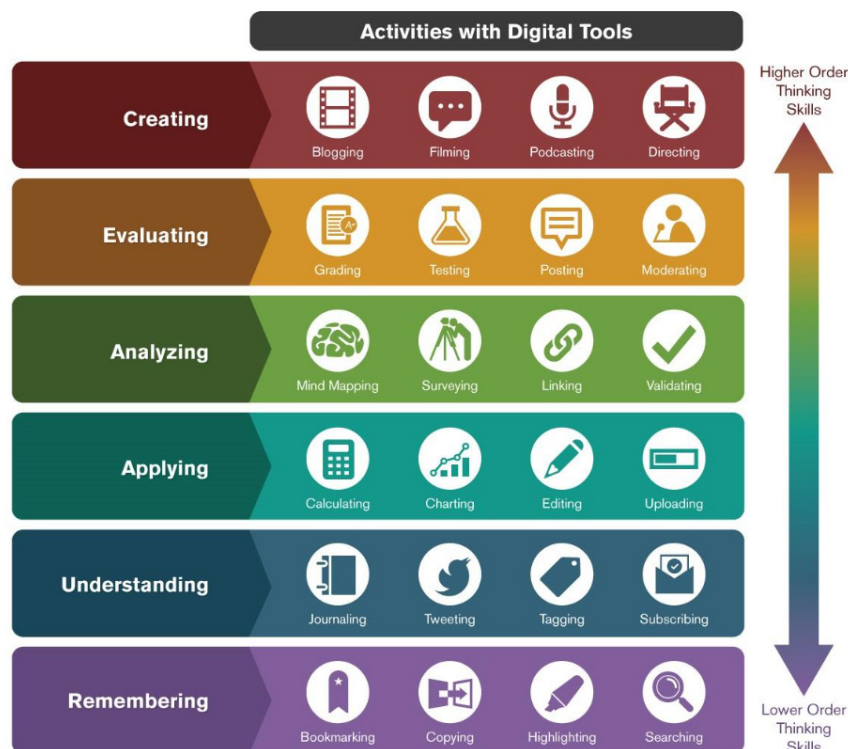


Fig 5. Bloom's digital taxonomy (Infographic Credit: Ron Carranza)

Selecting the most appropriate digital activity will depend on the activity's level of difficulty tied to the cognitive levels stated within Bloom's Revised Taxonomy.

Application

The method of teaching in Nagaland is accustomed to old standards, leading teachers to refrain from the use of 21st-century technological skills. The learning activities at the school level have remained far removed from technology. Hence, it is necessary to understand the basic concepts for teachers in the creation of reliable assessments or activities using digital tools, whether it be for the online or the conventional classroom setting.

For this, we focus on optimizing the lower levels of Bloom "Remembering", "Understanding", and "Applying" and connect the digital Bloom Taxonomy to IC integration tools such as Youtube, Microsoft Office, online tests, and quiz applications, by creating varieties of different activities (N.Husain, 2021). These can be directly sent to the students and can be automatically graded along with feedback.

Below is an example of setting up online assessments with the integration of ICT tools using Digital Bloom's Taxonomy:

Anna is a professional baker; she is looking for a suitable location for her new business.

Question: What factors need to be taken into account before a decision is made?

Level I and II: Remembering and understanding: YouTube video (For students to see the video and answer the questions provided by the teacher as back channeling).

Level I and II: Remembering and understanding: LMS quiz features/Quizlet etc (To create quizzes, review, and grade online).

Level I, II, and III: Remembering, understanding, and applying: MS. Office/MS. Word (For Students to type in the answers to the questions set by the teacher, as an offline strategy).

Level I, II, and III: Remembering, understanding, and applying: Ms. Office/MS. PowerPoint (To create presentations as an offline strategy).

1.3 SAMR model featured in NagaEd horizons

SAMR model

Reconsidering what quality technology integration into remote and blended learning should look like, NagaEd takes the SAMR approach. This simple SAMR ladder combined with Bloom's revised taxonomy will guide teachers on how teachers integrate technology into their courses.

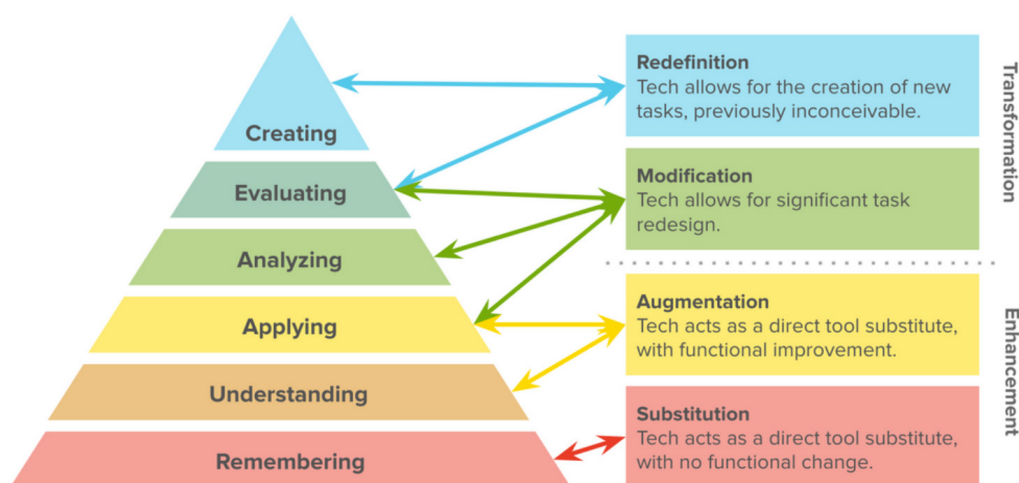


Fig 6. SAMR ladder coupled with Bloom's revised taxonomy

As categories move from lower to upper levels of Bloom's taxonomy, they also move from lower to upper levels of SAMR. The three lower levels of Bloom (Remember, Understand, Apply) are correlated with the two Enhancement levels of SAMR (Substitution, Augmentation). Whereas the two transformation levels of SAMR (Modification, Redefinition) are associated with the upper levels of Bloom (Analyze, Evaluate, Create) (Ruben, 2014). In turn, within each grouping a similar ordering occurs, i.e., Remember-type tasks are primarily associated with S-level uses of the technology, Understand-type tasks are associated with either S-level or A-level uses of the technology, and so on. The diagram above illustrates this association.

Application

The tools in the LMS empower teachers and students to meet every aspect of digital learning and take them to a new level. By using SAMR, teachers can start using the basic features within the LMS to achieve digital learning. As teachers and students become more comfortable with the LMS, they can move towards integrating more of the tools available to them.

This combined approach of SAMR and Bloom's taxonomy includes its elements into the NagaEd horizons.

With both Bloom's Taxonomy and the SAMR Model of technology Integration, the complexity is increased at each level. Horizon 1 includes the basic features of the LMS to enhance the existing teaching practice and help students in carrying out their tasks efficiently. In Horizon 2 the complexity is increased, allowing teachers to modify tasks in a collaborative, student-centred environment where technology tools are the central focus of learning.

The checklists below provide a wide plan for teachers to achieve digital learning standards with an emphasis on the 'substitution and augmentation' of SAMR and the three lower levels of Bloom 'remembering, understanding, and applying'.

Features into NagaEd Horizons	
Horizon 1	Horizon 2
<ul style="list-style-type: none"> Registration/ Enrollment Courses Digital Textbook Question Bank Online Assessment <ul style="list-style-type: none"> *Multiple Choice *True/False * Fill in the blank Automated Marks Instant Feedback Pre-recorded videos Offline Content/Notes <ul style="list-style-type: none"> *PDF/Word Document/Slide Examination Guide <ul style="list-style-type: none"> *Model Test Paper Manual/Reference Guide Technical Support Service Student Feedback 	<ul style="list-style-type: none"> Content Upgrade Digital Textbook with added interactive tools Micro Learning Video Lessons Online Assessment-Enhanced <ul style="list-style-type: none"> * Discussions/ Group Assignments/ Case Studies <ul style="list-style-type: none"> *Peer Review *Online Submissions Gradebook Management Student Learning Mastery Webinar Remedial Classes Build Online Community Plagiarism Detector Educator Professional Development Program

SAMR/Bloom's taxonomy

Digital learning with the LMS checklist	Substitution/Remembering	Augmentation/Understanding, Applying
Component 1: Assessment and data	<ul style="list-style-type: none"> Use the LMS quizzes to give formative and summative assessments to students 	<ul style="list-style-type: none"> Utilize LMS question banks to create unit-specific sets of questions Differentiate the LMS assignment due dates
Component 2: Collaborative digital learning environment	<ul style="list-style-type: none"> Create and assign groups in the LMS 	<ul style="list-style-type: none"> Facilitate group discussions in the LMS Assign peer reviews in the LMS
Component 3: Community	<ul style="list-style-type: none"> Use external links in the LMS to link students to outside resources 	<ul style="list-style-type: none"> Link to external discussion boards and community pages in the LMS
Component 4: Feedback	<ul style="list-style-type: none"> Use the LMS grade book to give grades to students 	<ul style="list-style-type: none"> Provide constructive feedback to students in the LMS speed grader
Component 5: Digital content and instruction	<ul style="list-style-type: none"> Use the LMS content pages link students to external websites 	<ul style="list-style-type: none"> Use the LMS assignments, discussions and quizzes
Component 6: Digital citizenship	<ul style="list-style-type: none"> Guide students in discussion prompt responses in the LMS 	<ul style="list-style-type: none"> Participates in the LMS discussion with students Communicates with students via the LMS mail or feedback in speed grader
Component 7: Accessibility	<ul style="list-style-type: none"> Post syllabus in the LMS to ensure all students are aware of procedures and availability of both the content and instructor 	<ul style="list-style-type: none"> Use the LMS inbox to email students Use the LMS calendar to make assignments and events visible to students

02 The course design approach and implementation

The NEP envisions a student-centric education system as stated in chapter 5 (5.15) “Teachers will be given more autonomy in choosing aspects of pedagogy, so that they may teach in the manner they find most effective for the students in their classrooms—Teachers will be recognized for novel approaches to teaching that improve learning outcomes in their classrooms.” (NEP, 2020). Contextualized to the local environment, the NagaEd pedagogical approach emphasizes the constructive alignment of teaching principles. It focuses on using the course learning outcomes (CLOs) in official course outlines to frame possible choices in course design; thus, allowing the teacher a defined space within which to exercise their unique style. Constructive alignment overlaps and leads into the next theory, Backwards Design where each stage can be revisited and refined further based on the circumstances. It, too, begins with CLOs, but more specifically at what successful fulfillment of those CLOs looks like, and then working backwards through your teaching to inform design choices that provide content and learning activities to prepare students for eventual assessment.

2.1 Constructive alignment

Constructive alignment of learning is a method of organizing learning outcomes, teaching practices, and assessments in a systematic way that connects units to the overall content of the course. The goal of constructive alignment then is to support students in developing as much meaning and learning as possible from a well-designed, coherent, and aligned course. Below is a flow chart outlining constructive alignment.

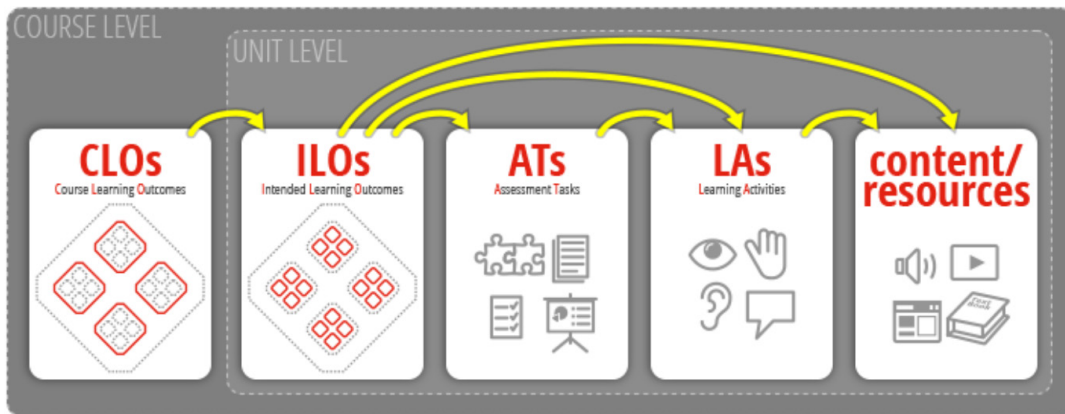


Fig 7. Constructive alignment diagram, Beale Gurney & Nell Rundle, CC BY-SA

To ensure that your course flows logically overall and that the intended learning outcomes are addressed in every interaction, it is essential to map out your course from the outset of the design process. The key is that all components in the teaching system: the curriculum and its intended outcomes, and the teaching methods used in the assessment tasks are aligned with each other.

2.2 Backward design model

Backward Design is a planning framework in which you start with the end in mind, the desired outcomes. Once you have determined what you want the students to be able to know you'll define how you will know if the student has achieved those outcomes. Finally, think about how you can best prepare students to be successful on an assessment and achieve the outcomes. This planning involves identifying learning materials, activities for students to complete online or in class, and what teaching strategies you will use. Activities need to support the learning outcomes and prepare students for successful performance on the assessments, and the assessments must directly align with the outcomes.

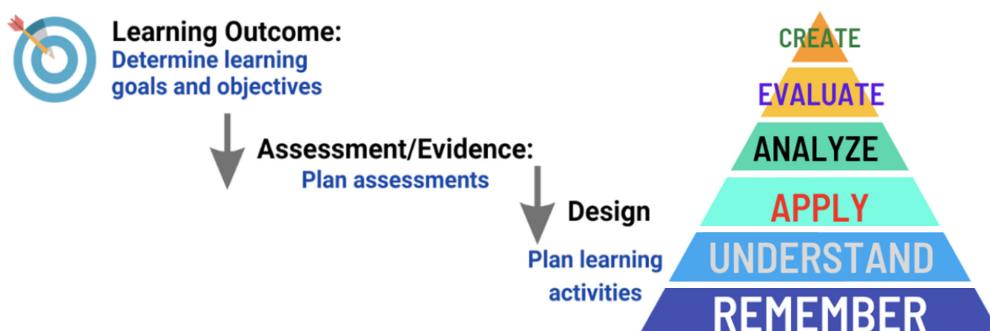


Fig 8. Backward design model

Implementation

In a traditional approach, teachers begin designing their courses by thinking of which materials or favourite activities to use, but that leads to thinking about the teaching first. The goal of backward design is to help teachers think about learning outcomes first. Setting up specific course goals that describe what students should learn and be able to do in terms of skills, knowledge, and attitudes should be the first step in the course design process.

Stage 1: Learning objectives

Learning objectives are the cornerstone of your digital course. When articulating learning objectives, it might be helpful to look at them in terms of “macro-objectives” and “micro-objectives.” Macro objectives are typically the big-picture items that identify what students will be able to do by the end of the course—what you might think of as “traditional” learning objectives. Micro-objectives, on the other hand, are the skills students will need to master to accomplish the macro-objectives. This distinction helps you ensure that students either have or will learn the component skills necessary for success.

Course learning outcomes

Creating a list of subject matter topics for a syllabus has traditionally been the first step in course planning for many teachers. Instead of starting with the subject matter, start with the learning objectives for the course.

Sample learning goals:

At the end of this course, students will be able to:

- Explain scientific concepts, principles, and theories used in the fundamental branches of science and apply them to relevant contexts.
- Communicate ideas effectively in writing.
- Develop a greater appreciation for how scientific knowledge is generated.
- Independently learn more about something you are curious about.
- Evaluate an experimental design
- Independently learn more about something you are curious about.

Intended learning outcomes

Learning goals lead to learning objectives-what students do to demonstrate that they have achieved the learning goals. Include a clear, measurable action verb and specific conditions under which the student will perform the action.

Bloom's taxonomy action verbs can be helpful when writing learning objectives. Organize the learning objective in accordance with Bloom's Taxonomy to ensure that everyone engaged is aware of the goals and expectations. The many verb tables (Bloom's taxonomy verbs) will help to identify the action verbs which align with the different levels of learning within each domain. The diagram below lists some of these associated tasks within the cognitive domain.

KNOWING or REMEMBERING	COMPREHENDING or UNDERSTANDING	APPLYING	ANALYZING	SYNTHESIZING or EVALUATING	CREATING
Cite	Arrange	Adapt	Analyze	Assess	Adapt
Define	Associate	Apply	Appraise	Assemble	Anticipate
Draw	Classify	Compute	Detail	Build	Collaborate
Enumerate	Convert	Coordinate	Determine	Choose	Combine
Find	Describe	Demonstrate	Calculate	Compare	Communicate
Label	Discuss	Develop	Categorize	Construct	Compose
List	Explain	Dramatize	Classify	Debate	Construct
Locate	Exemplify	Employ	Compare	Estimate	Create
Match	Identify	Establish	Contrast	Formulate	Design
Memorize	Interpret	Examine	Correlate	Generate	Facilitate
Name	Locate	Extrapolate	Critique	Hypothesize	Forecast

Fig 9. Bloom's taxonomy action verbs that correspond with each classification, as well as an appropriate assessment method, are highlighted in the table above

Bloom's Taxonomy is presented as a spectrum of lower-order thinking skills to higher-order thinking skills. As you write your ILOs, do your best to cover as much of this spectrum as possible. How easily you can cover this spectrum will be dependent on the level of class you are teaching. Lower-level courses may tend to focus more on ILOs written to address lower-order thinking skills (left side) with only a few ILOs that fall in higher-order thinking skills (right side). Higher-level courses may tend more to the right side of the spectrum. Try to make sure that your learning objectives don't all come from the same level of the taxonomy. Don't try to cover the entire spectrum, but it is doubtful that your goals only require one area.

Sample learning objectives:

At the end of this module/unit, students will be able to:

- Identify and label anatomical and cellular features in both human and plant biological systems
- Differentiate the characteristics of the animal and plant cells and their working functions
- Recognise the relationships of biological systems, specifically how they operate as connected units
- Apply their knowledge of anatomy in the context of illness and diseases

Writing ILOs using carefully considered action verbs to relate the content of the teaching to the level of expected understanding helps you to plan your teaching. The strategy can be applied at all levels, from an individual lecture to a whole course.

Stage 2: Assessments

The second stage of backward design has teachers consider the assessments and performance tasks students will complete in order to demonstrate evidence of understanding and learning. In the previous stage, the teacher pinpointed the learning goals of the course. Therefore, teachers will have a clearer vision of what evidence students can provide to show they have achieved or have started to attain the goals of the course. Consider the following two questions at this stage:

- How will I know if students have achieved the desired results?
- What will I accept as evidence of student understanding and proficiency?

Formative assessment and summative assessment are the two principal ways of establishing and analyzing student progress. Weaving one with the other will greatly improve a student's holistic ability to prepare for end-of-term exams or other forms of standardized testing. NEP mentioned in chapter 4 (4.34) "The aim of assessment in the culture of our schooling system will shift from one that is summative and primarily tests rote memorization skills to one that is more regular and formative, is more competency-based, promotes learning and development for our students, and tests higher-order skills, such as analysis, critical thinking, and conceptual clarity" (NEP, 2020).

Formative	Summative
<ul style="list-style-type: none"> • Used during the learning process • Provides feedback on learning-in-process • Dialogue-based, ungraded 	<ul style="list-style-type: none"> • Used at the end of the learning process • Evaluates student learning against some standard or benchmark • Graded

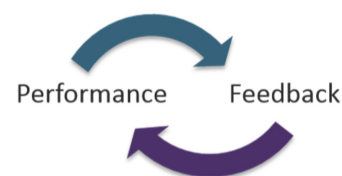
Fig 10. Comparison between formative and summative assessments (Source: queensu.ca, teaching, and learning)

"When the cook tastes the soup, that's formative. When the guests taste the soup, that's summative." Paul Blake (1998)

In an asynchronous digital course, it is important for students to get frequent feedback on how they are doing. The most effective way to ensure that students get the feedback they need to stay on track is through a comprehensive, balanced assessment strategy that includes both formative and summative assessments. Assessments that are aligned with your learning outcomes provide reliable feedback about student learning. Clearly aligning assessments to desired learning outcomes also reinforces to students what needs to be mastered and helps them track their progress in the course. For this, use Bloom's taxonomy verbs to align assignments. This will help you to leverage the LOT skills and further move to HOT skills in order to teach and assess students in the most reliable way.

Formative assessment

Formative assessment is designed to provide feedback to students about how well the learning process is going. Examples of formative assessments include weekly quizzes, discussions, surveys, reflections, and homework assignments.



Create ungraded self-tests using the LMS Quizzes tool and discussion forums. The Assignments tool in the LMS provides options for blind peer review, or you can set up a discussion where students post their thoughts or explanations and then provide feedback on another student's assignment submission. Have rubrics in assignments that will provide students an opportunity to self-assess their work in a formative way.

Summative assessment

Summative assessment is designed to provide evidence that students have achieved a learning outcome or otherwise gained skills or knowledge throughout the course. Use summative assessment to evaluate student learning and knowledge at the end of an instructional period, such as the end of a module or course. Summative assessments are usually graded. Examples of summative assessments are graded tests at the end of a module, final essays, final presentations, etc. Formative assessments should be used in conjunction with summative assessments.



Ipsative assessment

An assessment approach that focuses on comparing students' previous performances and links them to long-term progress. Learners work towards a personal best rather than always competing against other students (Thayer, 2017).

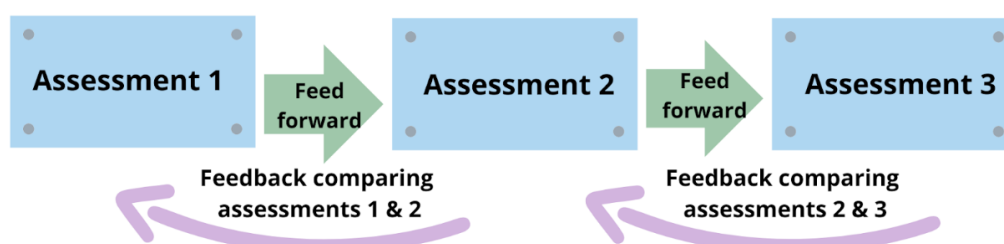


Fig 11 Hughes' Ipsative assessment approach scheme. (Source: entreassess.com, *Ipsative assessment*, Tryggvi Thayer)

By adopting this method, you make sure that students stay right on track and keep improving with the help of goals and objectives. It boosts self-confidence and self-esteem, especially for students who don't get good marks or are turned off by competitive surroundings.

Have a reflection and sharing section at the end of each module and encourage students to reflect on both current and prior understandings of concepts and practices. After the student completes an assignment, ask them to list previous feedback points and how they addressed this feedback in their current assignment. Then provide further feedback on how well the previous feedback had been addressed and the progress the student was making as well as suggesting the next steps further. Change the way you interpret the results from an absolute perspective e.g. a student knows x,y,z; or this student scored 7.6 on this test), to a relative and comparative one (e.g. this student improved from a 4.5 to a 6.7 reading level). Keep in mind that improvement over time is really the crucial measure of a student's learning progress, not the competencies attained or the test results alone.

Below is a chart showing guidelines for when you might choose to use the LMS Assignment versus the LMS Quiz.

LMS Assignment	LMS Quiz
<p>Submission details</p> <ul style="list-style-type: none"> Students will upload and submit just a file Students will be completing primarily handwritten work <p>Grading</p> <ul style="list-style-type: none"> Include in-line feedback comments on a submitted file All submissions require teacher input—no auto-scored question types Peer Review options <p>Common Assessment Types</p> <ul style="list-style-type: none"> Essays / Papers Submitting a URL (for a blog or other online work) Video / Audio (can be done through assignment or uploaded to assignment) Presentation files 	<p>Submission details</p> <ul style="list-style-type: none"> Students will answer multiple questions of different types Student submissions are a combination of online submission and minimal handwritten work <p>Grading</p> <ul style="list-style-type: none"> Contains auto-score question types (multiple choice, fill-in-the-blank, matching, etc.) <p>Common Assessment Types</p> <ul style="list-style-type: none"> Practice Quizzes / Surveys Assessments with auto-scored question types Knowledge retention assessments Assessments with multiple short answer questions on varying topics.

In a nutshell, learning should not only be dependent on how well a student can memorize. Rather, it should also take other aspects, such as practical skills and efforts, into account. Using the same types of assessments over and over may prove to be ineffective. To get the desired optimum results it is always preferable to adopt several assessment types to add value to students' learning. Also, re-revisit the course learning outcomes and consider where the assessment fits into the "big picture" of your course, and how it maps to the overall learning outcomes. The ultimate goal of any assessment would be to help students improve their overall studies.

Stage 3: Design instruction

Contents and learning activities

The final stage of backward design is when you begin to consider how you will teach. With the learning goals and assessment methods established, you will have a clearer vision of which strategies would work best to provide students with the resources and information necessary to attain the goals of the course.

The key questions are:

- What knowledge (concepts, ideas, interpretations, applications) must/should/could be included to enable students to achieve the intended learning outcomes?
- What generic process knowledge and skills should the student have been taught by the end of the unit?
- What context in the discipline do the students need to have by the end of the unit?
- What is the appropriate balance of content: depth/breadth, knowledge/skills, and processes/values?

Each area of content should also be considered in terms of a number of criteria

Significance validity	Relevance utility	Interest learnability
<ul style="list-style-type: none"> Content should be accurate, current, and relevant to the aims and intended learning outcomes. 	<ul style="list-style-type: none"> In this context, the subject matter of a curriculum should be selected in the light of its usefulness to the learner involving his/her problems now and in the future. 	<ul style="list-style-type: none"> Curriculum content should be learnable and adaptable to students' experiences. Focus the learning experience on the abilities of the learners.

Another element to bear in mind while constructing your content is that, no matter how effectively your structure holds students' interest, if you repeat the same set of activities week after week or module after module, eventually both you and your students will become bored. So, sticking to the structure while occasionally varying the activities is a good approach. Bloom's Digital Taxonomy will help in choosing a number of different learning activities for students, using a variety of digital tools.

03 NagaEd core elements

NagaEd has created a distinctive modular course architecture. Each chapter of the course is converted into a module by giving it a general lesson sequence that is pedagogically suited for that specific subject matter. The modules are constructed out of 6 core module blocks. These blocks provide the framework for a continuous, uninterrupted learning journey while maximizing access to digital education. The figure below illustrates the 6 core blocks that construct each module within a course.

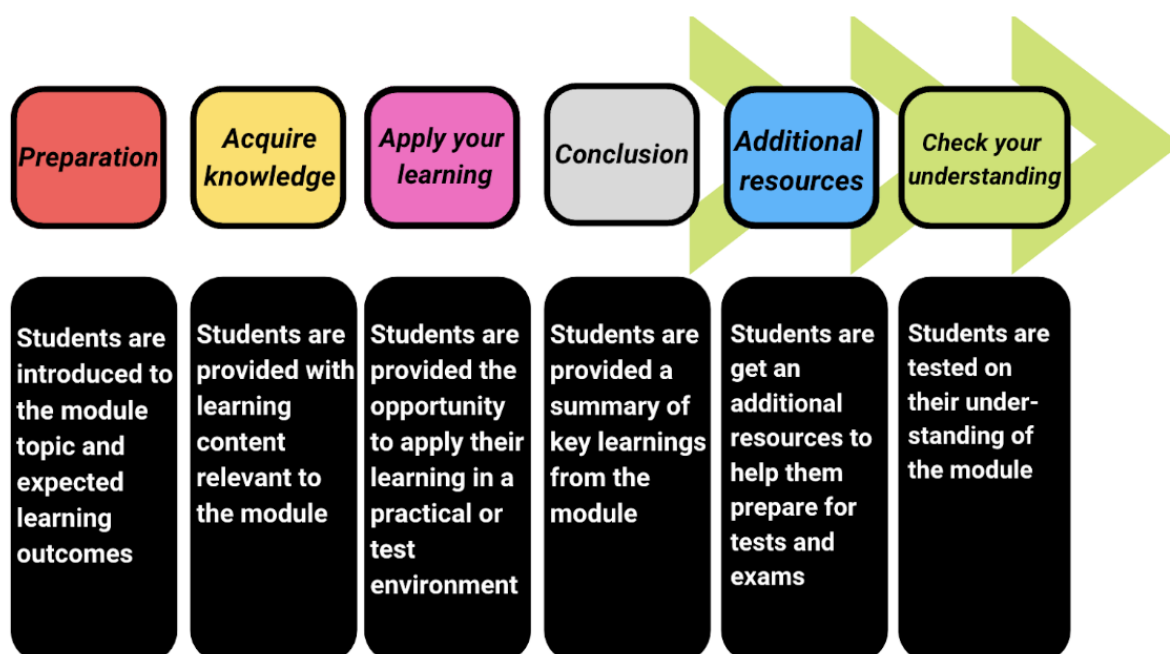



Fig 12. NagaEd's Six Core Elements

Once a goal has been clearly defined, appropriate assessments and coherent lessons are mapped, aligning each stage to the corresponding core elements to create a module. When you're doing this it's a very good time to also explicitly call out how the course design approaches and pedagogy link together.

3.1 Preparation

The first element, “**Preparation**” contains the objectives and an introduction to the module content. Use Bloom’s taxonomy action verbs as described above to write your learning objectives.

Sample learning outcomes in a digital course:

**CLASS 9**
Science

Learning Outcome

- Identify and explain the basic components of a prokaryotic cell.
- Identify and explain the basic components of a eukaryotic cell.
- Differentiate between the two types of cells and identify areas of commonality and uniqueness among them
- Identify and explain the components of the cell membrane.
- Identify and explain the components of the nucleus.
- Identify the organelles of cells.
- Explain how these organelles connect to others and the work of the cell.
- Identify the key learning points for the cell.
- Apply their knowledge about the cell.


In the Introduction provide a rationale and highlight the module's relevance by describing how it fits into the course. Provide a brief overview of the new material and remind students what they have already learned and how this new information will build on their previous knowledge.

Sample Introduction to a module in a digital course:

Introduction to the fundamental unit of life

As you all know the body of an individual is of complex type. If we study about the detailed structure of the human body or of any lower organism, we will come across many things that makeup the body. But at the smallest level, our body is made up of tiny units called cells. Let us learn about cells in detail.

Cell is often referred to as the “structural and functional unit of living organisms”. The reason is that the cell is the smallest unit of body and directly or indirectly, it is responsible for functions also.



Robert Hooke (Source: Wikipedia)

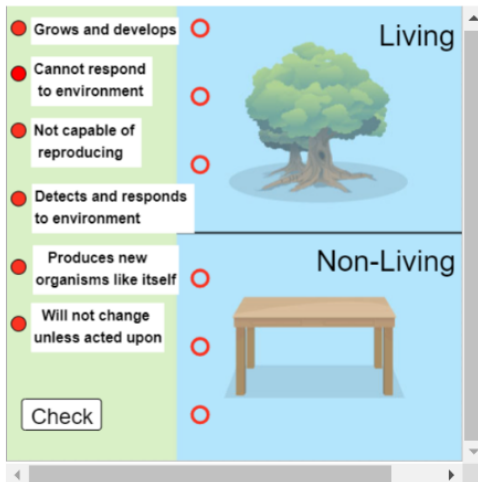
The word cell is derived from the Latin word ‘cellula’ which means ‘a little room’. While examining a thin slice of cork, Robert Hooke in 1665 discovered a honeycomb-like structure called Cells. Cork is a substance which comes from the bark of a tree.

For a more immersive experience check out this interactive

Characteristics of life.

Life is a difficult state to define. Living and non-living things are made of the same matter but behave in different ways that seem obvious but can be tricky to put in words. Here are a few of the characteristics we use to define living things. See if you can correctly sort them as relating to living or non-living things.

- Drag each term into a red circle in the "living" or "non-living" spaces.
- Click the "check" button to check your work.



3.2 Acquire your knowledge

This element incorporates stage 2 (Formative assessment) and stage 3 of Backward Design covers a broad area and includes multiple topics. Therefore, separate this material into sections (lectures, discussion board forums, reading requirements, self-assessment activities, and so on). Include presentations of media for the purpose of explaining, discussing, or elaborating on concepts from the module. Your selection of learning and teaching methods should be related to the intended learning outcomes for the module. Link discussion boards and audio files that will serve as the means of interaction between you and your students.

Sample contents and learning activities in a digital course:

Cell wall in plant cells is composed of cellulose. Cell wall helps the cell to withstand the vagaries of nature. If a cell is present in a very dilute medium, the cell wall prevents it from bursting which may happen because of too much water entering the cell due to osmosis. In other words, the cell wall helps in maintaining the osmotic pressure or turgor pressure inside the cell.

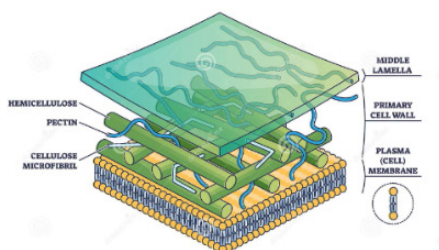
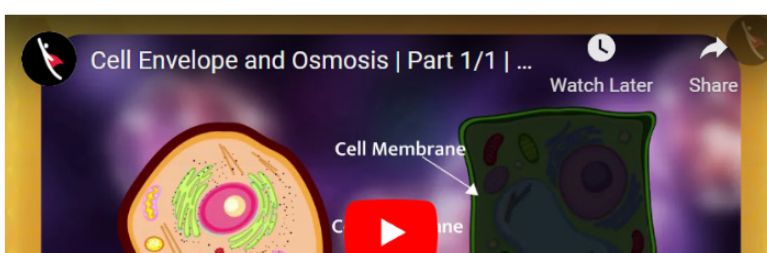


Fig: Internal structure of a cell wall (Source: Dreamstime)

Please refer to the following document for detailed content:



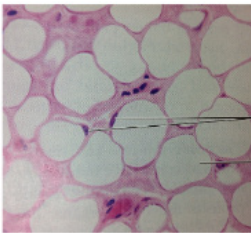
Provide practice quizzes that give opportunities for immediate feedback to the students as far as how much of the material they are understanding and retaining. Do not forget to give comprehensive instructions on how to participate, submit or accomplish every learning activity in a module.

Sample practice quiz in a digital course:

Question 1

1 pts

What tissue is this? Hint: it is found around joints, and acts as a food reserve.



☐ Blood

☐ Cartilage

☐ Adipose

☐ Bone

3.3 Apply your learning

Include regular formative assessments (Stage 2 Backward Design) to help students identify their strengths and weaknesses as they begin learning new terms and concepts in modules. Ensure students receive timely feedback on their formative assessments, whether the feedback comes from you or automatic grading. This will help students prepare for larger summative assessments.

Self-check formative assessments

1. LMS quizzes

- Provide a practice quiz to help students check their understanding of the course concepts.
- You can also collect feedback from your students by adding certain questions in the quiz section that will help you to adjust and improve your teaching and help you respond to students' needs quickly and consider your own teaching goals.

Sample assessment of teaching:

Question 6

1 pts

So far what resources did you enjoy and/or find valuable? Choose all that apply.

☐ Check your understanding

☐ Videos lectures

☐ Notes

☐ Practical videos

☐ Practice quiz

- Add short videos or images into the quiz question field and provide response choices to allow students to quickly check their understanding with interactive instant feedback.
- Flashcards/Games/Interactive content. Register for free accounts and create/share your flashcards and games from:
 - Add short videos or images into the quiz question field and provide response choices to allow students to quickly check their understanding with interactive instant feedback.
 - Flashcards/Games/Interactive content. Register for free accounts and create/share your flashcards and games from:
- Use multimedia as a formative assessment
 - Record or upload video/audio/image uploaded to the LMS discussions.

3.4 Conclusion

Possible ways to conclude

- Give a summary of the main points that will enable students to remember the main ideas of the topic.
- Use questions to assess students whether they have grasped the main ideas of the lesson.

Sample conclusion of the module:

What you have learnt

- Tissue is a group of cells similar in structure and function.
- Plant tissues are of two main types: Meristematic and permanent.
- Meristematic tissue is the dividing tissue present in the growing regions of the plant.
- Permanent tissues are derived from meristematic tissue once they lose the ability to divide. They are classified as simple and complex tissues.
- Parenchyma, collenchyma and sclerenchyma are three types of simple tissues. Xylem and phloem are types of complex tissues.
- Animal tissues can be epithelial, connective, muscular and nervous tissue.
- Depending on shape and function, epithelial tissue is classified as squamous, cuboidal, columnar, ciliated and glandular.
- The different types of connective tissues in our body include areolar tissue, adipose tissue, bone, tendon, ligament, cartilage and blood.
- Striated, unstriated and cardiac are three types of muscle tissues.
- Nervous tissue is made of neurons that receive and conduct impulses.

3.5 Additional resources

Embed learning resources such as notes, concept maps, articles, newspaper articles, etc. into your course to assist your students to enhance their learning process. Organize lecture notes for your students to increase their comprehension and memory of large amounts of information. This will help students to see related concepts and make meaningful connections with the material, thus acquiring higher levels of learning.

Sample additional resources in a digital course:

View all pages

10.6 Fast Revision

Please refer to the following additional resources

[10.6.1 Mind Map.docx.pdf](#) ↓

[10.6.2 Real Life Application.docx.pdf](#) ↓

[10.6.3 Notes.\(Light\).pdf](#) ↓






[10.6.4 Questions and answers.docx.pdf](#) ↓

3.6 Check your understanding

Integrate summative assessment (Stage 2 Backward Design) after a series of learning units/modules to measure if the desired learning outcomes of the module were met. Remote summative assessments can be administered in various formats:

- **Take-home exam/ Assignment:** A take-home exam or assignment can be completed outside of the classroom at the student's pace, and then submitted via the LMS.
- **Test:** Provide a set of questions in a quiz format delivered through the LMS. The question type may range from multiple choice to short answers.
- **Project-based assignment:** Give group work, presentations, reports, and creative work that students will complete outside of class and can be submitted in a file format via the LMS.

Design appropriate assignments that will allow students to demonstrate their gained skills, knowledge, and values. Formulate the questions to require remembering, understanding, and applying to leverage the three lower levels of learning in Bloom's taxonomy (keepteaching.ucsd.edu).

Learning objective/order of thinking	Definition of the order of thinking	Assessments that align with the order of thinking
Remember	Retrieve information such as terms, facts, and concepts from memory	 Multiple choice, Matching, Fill-in-the-blank, True/False, Self-Check, Label, Identify terminology and facts
Understand	Construct meaning from instructional messages and content	 Short Answer, Compare-and-Contrast, Identify examples or principles  True/False, Multiple Choice, Problem Sets, Categorize  Reading Summary, Paraphrase, Short Essay
Apply	Carry out or use a procedure in a given situation	 Demonstrate a process, Complete a new task, Simulation, Reflection, Presentation, Problem Sets

04 Consistency and accessibility

Among other factors, clarity and consistency are foundational to building a course with Universal Design for Learning (UDL) principles in mind.

- **Naming conventions:** Do the titles of your modules and activities accurately describe what they are and how students should interact with them?
- **Layout, location, and ordering:** Do students always obtain the same types of assignments from the same location? Is it clear when things begin and when they are due? Are things simple to find?
- **Text, icons, color, formats:** Have you considered how the course looks? Are your formatting and style elements consistent and accessible to all students?
- **Scheduling:** Will students get a sense that some things are always due on Tuesdays at midnight? Will they be able to establish a routine for learning?

Keep the same rhythm for assignment due dates and communication with your students.
For example:

- **Monday:**
 - 3:00 pm: Send weekly announcements
 - 7:00 am: Post grades and feedback
- **Wednesday:**
 - 6:00 pm: Send reminders to complete weekly assignments (Send reminders because it is easy to forget about assessments in an online course)
- **Thursday:**
 - 6:00 pm: First discussion due (Thursday deadlines will give group members some time for fruitful discussions with their peers before the end of the week)
- **Saturday:**
 - 1:00 pm: Weekends - complete all weekly assignments.

05 Conclusion

The current education is mostly based on standard content-heavy and traditional rote learning which fails to solve life's complexities. The NEP2020 addresses this gap and serves as a catalyst for overhauling the educational system in order to increase future generations' employability. It lays particular emphasis on the development of the creative potential of each individual that can be achieved by using Bloom's taxonomy framework. The introduction of digital education in a blended mode of learning will prepare students for a technology-driven world to transform the traditional education system into a newer and more flexible version that is robust and agile.

It is a long-term journey to create a solid framework of a learning design contextualized to the local environment. NagaEd refocuses on the lower levels of Bloom to strengthen students' foundation of knowledge and prepare them to achieve their higher-level critical thinking skills. To achieve this, we follow the best practices of instructional design approaches to maximise the learning outcomes in students. The SAMR approach combined with Bloom provides a technology roadmap for teachers to fuel effective instruction aligned to tribal and indigenous communities. It is incorporated into the NagaEd Horizon 1 and Horizon 2 with the use of 21st-century technological skills as proposed by the NEP2020. This approach not only drives to reach the upper levels of Bloom's Taxonomy but also acts as a drive to reach the upper levels of SAMR through technology integration. The six core components, each with a clearly stated goal and planned-to-learn activities, are in line with the course design approach and methodologies. This is the first-step guide with practical steps, of course, design approaches and pedagogy towards achieving blended education in the digital technology world.

06 Recommendations

The NEP2020 provides autonomy for the schools to develop a learning program sensitive to the community's needs. The SAMR with Bloom may serve as the best strategy to produce digital literacy and the skills of the 21st century for students and know about applying their learning in real-life situations. The model aligns the single processes to create a strong concept of technology interaction in teaching as proposed by NEP. The Constructive Alignment and Backward Design approach will give the teachers the right direction in their course development, formalizing traditional practices into lessons which are relevant to the community. To achieve an ideal blended learning environment teachers should consider all of those different learning approaches. Presenting learners with a variety of opportunities to maximize the individualization of learning content for each student without limiting their eLearning creativity. The course modular architecture grounded in the basic instructional design principles will help connect every student towards a learning experience that is fully inclusive and build a foundation for active learning.

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