




Najd National Schools
International Program

Teaching and Learning Framework



Contents

Teaching and Learning Framework	4
Curriculum Vision	4
1- John Sweller's Cognitive Load Theory	6
2- Piaget's Schema Theory: Constructing and Linking Knowledge	8
3- Rosenshine's Principles of effective teaching	10
Planning a knowledge-rich curriculum	13
Complex Tasks	14
Curriculum Design and Sequencing	14



Teaching and Learning Framework

NNS Boys, International Program has developed a Teaching and Learning Framework that informs curricular thinking across all the school. The framework is based on key principles and theoretical perspectives that are supported by reliable research.

The framework describes what NNS believes are important features of effective teaching, learning, and assessment practices. The principles are not a checklist, but a framework that underpins their work to enable successful learning for their pupils.

The Teaching and Learning Framework encompasses the following components:


- Key principles and theoretical perspectives that shape curriculum development at NNS.
- Vital aspects of effective teaching, learning, and assessment practices.
- A foundational framework designed to facilitate successful learning for students.
- Informed by credible and robust research.

NNS' Teaching and Learning Framework is not a prescriptive checklist, but rather a set of principles that guide our work to support successful learning for their pupils.

Curriculum Vision

NNS-Boys is committed to delivering top-tier education to empower every student to realize their utmost potential. Our mission is to equip students with enriching learning experiences that prepare them for their future education and life both locally and globally.

Each day at NNS holds significance for our students. Our curriculum encompasses the knowledge students acquire through expert instruction, rigorous assessment, and valuable feedback. Additionally, we instill metacognitive skills to foster independent learning, provide a wide array of extracurricular activities, and nurture cultural literacy, employability, and personal growth. Our curriculum embodies these core values:



Inspiration: We ignite a passion for lifelong learning through a stimulating curriculum that nurtures curiosity, fosters investigative skills, and promotes independence.

Inclusion: We ensure all students access a relevant, ambitious curriculum tailored to their needs, including disadvantaged learners, those with special educational needs, English language learners, and vulnerable students.

Innovation: We apply the latest educational research to continuously improve our curriculum and teaching strategies. This helps students transition knowledge into long-term memory and cultivate critical thinking, resilience, collaboration, problem solving, and leadership.

Integrity: We instill strong values in our students, preparing them to be responsible, respectful citizens who contribute positively to a diverse society.

Impact: Our ultimate goal is for all students to achieve robust academic and personal outcomes. We measure our curriculum's success by students' knowledge retention, formative assessments, summative assessment results, employability, and acquisition of skills for lifelong success.

The three foundational theories that support successful teaching and learning are integral to our approach at NNS. Our curriculum is laser-focused on what matters most—ensuring students learn and retain the core knowledge and skills they need. Our educators meticulously plan the content to be taught, determine the most effective methods of instruction, and assess to ensure mastery.

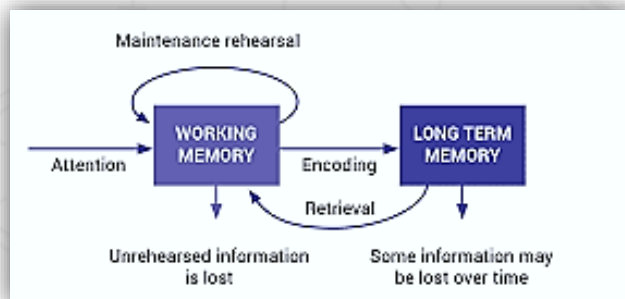
We draw upon three key theories that guide our overarching approach:

- **Cognitive Load Theory** - minimizing unnecessary load to focus on essential concepts
- **Schema Theory** - building schemas in students' minds to organize knowledge
- **Principles of Effective Pedagogy** - utilizing evidence-based methods to optimize instruction

By integrating these perspectives, we aim to provide an impactful curriculum that enables our students to truly excel. Our goal is for students to **gain enduring knowledge and skills, achieving their academic potential**. We are committed to continuous refinement through **teacher training, support, and curriculum evaluation** focused on the outcome that matters most - **student learning and success**.


1- John Sweller's Cognitive Load Theory

John Sweller's Cognitive Load Theory posits that effective learning occurs when instructional methods align with the human cognitive architecture. The theory emphasizes the limitations of our short-term memory and the importance of schemas in our long-term memory.



Here's a summarized and rewritten version of the provided content:

John Sweller's theory revolves around the concept of cognitive architecture and how humans process and retain information. When students are taught, they absorb information primarily through visual and auditory means. Sweller refers to these as 'channels' through which data enters our short-term memory (STM). This STM acts as a temporary storage and filter, determining what information is essential and what can be discarded.



For learning to be effective, certain information transitions from the STM to the long-term memory (LTM). Once in the LTM, this knowledge can be recalled and utilized, especially in educational settings. However, transferring knowledge from STM to LTM isn't always straightforward. The STM can only handle a limited amount of new information before it becomes overwhelmed. If overloaded, students might struggle to understand the content, leading to confusion. Sweller terms this as 'cognitive overload', which can hinder the transfer of knowledge to the LTM.

To optimize learning, Sweller's theory suggests three primary strategies:

1. **Minimize Cognitive Overload:** Ensure that students aren't overwhelmed with too much information at once.
2. **Facilitate Knowledge Transfer:** Create conducive environments for information to move from STM to LTM.
3. **Promote Recall:** Provide opportunities for students to recall and apply knowledge, strengthening their memory and understanding.

In practical classroom settings, this translates to:

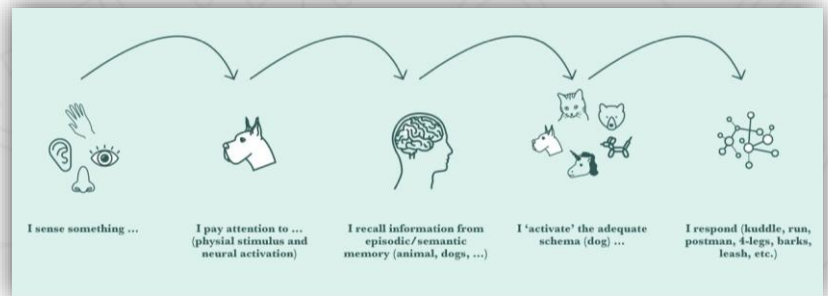
- Breaking down learning into manageable chunks.
- Ensuring clarity in tasks and instructions.
- Using both auditory and visual channels effectively.
- Building on students' existing knowledge.
- Regularly reviewing lessons to reinforce LTM.
- Avoiding distractions and emphasizing crucial information.
- Encouraging metacognition, where students reflect on their learning processes.

Furthermore, the act of retrieving learned knowledge, termed 'retrieval practice', strengthens memory. By repeatedly recalling information, students can achieve fluency or 'automaticity', allowing them to recall knowledge effortlessly. This positions them better for future learning.

In essence, Sweller's Cognitive Load Theory provides a framework for educators to design instructional methods that align with how the human brain processes and retains information.

2- Piaget's Schema Theory: Constructing and Linking Knowledge


Jean Piaget's schema theory emphasizes the significance of long-term memory in cognitive development. Piaget's research highlighted that children are only capable of performing



certain cognitive tasks when they are mentally ready. He outlined four primary stages of cognitive growth:

1. **Sensorimotor Stage (Birth to 2 years):** This is where the foundations of thought, memory, and imitation are laid down.
2. **Preoperational Stage (2 to 7 years):** At this stage, children begin to recognize symbols and experience language growth.
3. **Concrete Operational Stage (7 to 11 years):** Here, children develop the capability to tackle tangible problems using logical reasoning.
4. **Formal Operational Stage (12 years and above):** At this final stage, children can address abstract challenges using logic.

Recognizing these developmental stages is crucial for educators, as it influences teaching methodologies. Piaget believed that cognitive growth is a continuous process of mental restructuring. Schemas, or "cognitive frameworks," are the foundational elements of cognitive growth and education. Our long-term memory is composed of numerous schemas accumulated over time, which connect knowledge and provide meaning. The essence of learning revolves around modifying these schemas by assimilating new information and linking it with existing schemas.



As schemas evolve, they form intricate, interlinked networks of knowledge that grow progressively. Effective education enables students to form schemas by building upon their previous knowledge. Isolated and unlinked information is challenging for students to recall. However, when students are taught to associate new information with prior knowledge, it becomes more memorable. This interconnected knowledge is stored as a unified entity, reducing cognitive strain. When students can effortlessly recall the majority of items within a schema, they are deemed "proficient."

The more students learn, the easier it becomes for them to remember, as recalling a comprehensive schema is simpler than recalling isolated pieces of information. As these knowledge structures stored in long-term memory become more intricate, students' understanding deepens. New concepts and ideas become more memorable when students can relate them to existing knowledge, leading to a profound understanding.

At NNS, our primary focus is pinpointing the essential knowledge that students should retain. Our meticulously planned and sequenced curriculum assists students in acquiring this knowledge, enabling them to develop interconnected schemas. Educators carefully plan for the progressive development of more complex schemas and anticipate how new knowledge integrates into the broader context. The depth of students' understanding becomes evident as their knowledge structures in long-term memory grow increasingly intricate.

3- Rosenshine's Principles of effective teaching

In 2012, Professor Barak Rosenshine penned "Principles of Instruction: Research-Based Strategies Every Teacher Should Be Familiar With." This work was rooted in cognitive science studies about how our brains assimilate new data and investigations into potent classroom techniques. Rosenshine distilled his insights into ten pivotal principles:


Principle 1: Review of Previous Knowledge. Begin a lesson with a short review of previous learning: Daily review can strengthen previous learning and can lead to fluent recall.

Revisiting past materials reinforces the links between different knowledge points, deepening comprehension. Instant recall liberates the working memory. Rosenshine recommends spending five to eight minutes revisiting prior content, which can include peer assessments, posing questions, identifying misunderstandings, reviewing homework, and more.

Principle 2: Simplifying Complex Tasks. Present new material in small steps with student practice after each step: Only present small amounts of new material at any time, and then assist students as they practice this material.

Students can only absorb a limited amount of information at once. Overloading them with too much simultaneously can lead to cognitive strain and potential confusion. To





minimize cognitive load, introduce new information in manageable, small segments. Move forward only after ensuring the initial steps are well-understood.

Principle 3: Effective Questioning. Ask a large number of questions and check the responses of all students: Questions help students practice new information and connect new material to their prior learning.

Asking questions is one of the most effective tools a teacher possesses. Through questions, educators can identify misunderstandings, maintain the momentum of learning, and prompt students to delve deeper into a topic. Questions allow students to practice recalling information, fortifying their memory, and constructing schemas. Each time a student responds to a question, they access that information, facilitating its transition to long-term memory.

Principle 4: Provide models. Providing students with models and worked examples can help them learn to solve problems faster


When introducing a new idea, offer tangible examples and demonstrations. This aids in cognitive understanding. Present detailed examples, vocalize your thought process, and supply clear demonstrations, explanations, and guidelines.

Principle 5: Guide student practice. Successful teachers spend more time guiding students' practice of new material.

When presenting a fresh concept, provide clear examples and show practical demonstrations. This enhances cognitive comprehension. Showcase in-depth examples, articulate your reasoning aloud, and deliver straightforward demonstrations, clarifications, and instructions.

Principle 6: Check for student understanding. Checking for student understanding at each point can help students learn the material with fewer errors.

Regularly assessing students' comprehension ensures that the teacher can determine when they're prepared to advance to the subsequent topic. This approach avoids potential mistakes, misunderstandings, or the perpetuation of misconceptions in future lessons. It also allows teachers to identify if essential concepts require revisiting. Rosenshine recommends that teachers pose specific questions rather than merely



asking students if they have any queries, cautioning against equating silence with complete understanding.

Principle 7: Obtain a high success rate. It is important for students to achieve a high success rate during classroom instruction.


Rosenshine believes that an achievement rate of 80% strikes the right balance, indicating that students are both learning and facing challenges. This rate reflects ambitious teaching and learning. In Rosenshine's view, 70% is insufficient, while 95-100% implies the material is not challenging enough. Adopting a method of taking small steps and then practicing ensures students grasp essential knowledge and ideas before progressing.

Principle 8: Scaffolding. Provide scaffolds for difficult tasks: The teacher provides students with temporary supports and scaffolds to assist them when they learn difficult tasks.

Offer students a structured framework to bolster their comprehension. The order in which information is presented is crucial. As students' grasp and proficiency develop, these support structures or scaffolds can be incrementally withdrawn. Rosenshine advocates for techniques like modeling, verbalizing thought processes, and utilizing tools such as cue cards, checklists, and detailed examples. Educators can also foresee and address typical errors or misunderstandings within these scaffolded tasks, minimizing the likelihood of students repeating those errors.

Principle 9: Independent Practice. Require and monitor independent practice. Students need extensive, successful, independent practice in order for skills and knowledge to become automatic.

Independent practice allows students to work with minimal to no guidance. It should follow scaffolded, hands-on learning sessions. Once students have demonstrated proficiency in a task, they should engage in independent practice to achieve fluency and effortlessly recall knowledge. Rosenshine terms this repetitive practice for fluency as "overlearning." The content of independent practice should align with what was



covered during guided sessions, ensuring students are adequately equipped for the task.

Principle 10: Review. Engage students in weekly and monthly review: Students need to be involved in extensive practice in order to develop well-connected and automatic knowledge.

The act of retrieving recently acquired information helps anchor it in long-term memory. The more frequently this occurs, the simpler it becomes for students to link new content with what they already know. Rosenshine recommends conducting weekly and monthly reviews of past lessons to reinforce the recall of vital knowledge and skills, thereby fortifying the underlying schema.

Planning a knowledge-rich curriculum

At NNS, our educational approach is firmly centered on the acquisition of a substantial knowledge base, serving as the bedrock of our teaching philosophy. This approach unequivocally acknowledges that a strong grasp of the subject matter is a prerequisite for the development of advanced skills. Our Heads of Departments at NNS diligently oversee the curriculum, ensuring it is thoughtfully sequenced and laser-focused on essential knowledge and concepts. These elements are revisited to fortify learning and foster long-term memory retention, systematically preparing our students for every stage of their educational journey and equipping them for future success.

Within the NNS framework, it is paramount to establish secure educational foundations at each stage, ensuring students are well-prepared for subsequent learning. Furthermore, the identification and resolution of any knowledge gaps are considered imperative, as these gaps have the potential to hinder students' progress over time. Through regular assessments, educators can pinpoint areas of weakness. The meticulous planning and sequencing of curricula play a pivotal role in guaranteeing that new knowledge logically builds upon prior learning. This approach

facilitates effective retention and recall of essential knowledge. By structuring lessons in a systematic manner, students can realize their full potential.

Complex Tasks

To understand complex concepts or perform intricate tasks, it is essential to have a solid foundation of knowledge. Each multifaceted task consists of various components that need to be comprehended and mastered. This principle extends



to academic learning as well. Whether it's solving a math problem, crafting a report, or executing a dance routine, mastering the foundational components is pivotal for successful performance.

Curriculum Design and Sequencing

Curriculum Design: NNS adheres to the Understanding by Design Framework, a meticulous approach to curriculum design, emphasizing both substantive and disciplinary knowledge across various subjects and educational stages. This curriculum is structured with definitive endpoints for each segment, be it a unit, term, or year.



Collaboration is key, with subject departments, middle leaders, and educators working together to decide on content and its sequencing.

Our teachers, leveraging their subject-specific expertise, craft effective learning opportunities tailored to the age and needs of the students. They ensure lessons flow logically and offer ample opportunities for students to revisit and practice previously acquired skills and knowledge. A significant focus is placed on highlighting crucial content, with continuous reviews to ensure knowledge is firmly embedded in students' long-term memory. This approach aligns with the school's three guiding

theories for teaching and learning, striving to provide a comprehensive and ambitious educational experience for every student.

Curriculum Sequencing: It's the process of organizing, planning, and scheduling the content of a course of study to ensure that the material is presented logically and meaningfully. Proper sequencing can help students



connect prior learnings to new material, understand the relationships between different topics, and build upon existing skills and knowledge.

- **Pacing of the Content:** This determines the time and number of lessons necessary to cover a topic, ensuring that students have ample time to understand and master the material.
- **Sequencing of the Content:** This involves deciding the order in which topics should be taught, ensuring foundational knowledge is established before introducing more complex topics.
- **Sequencing of the Activities:** This pertains to deciding which types of activities should be used for each topic. Different activities can be more effective for different topics in engaging students and facilitating learning.
- **Sequencing of the Assessment:** This involves deciding which topics should be assessed and how often, ensuring that students are mastering the material.
- **Reinforcement:** This includes deciding which topics should be reviewed and how often, helping ensure that students retain the knowledge.

The sequencing of the curriculum is more than just ordering its components. It's about the relationships and connections between them, providing a deeper understanding for students. Proper sequencing tells the story of the subject and is a conversation between its parts. It's essential for an effective educational program as it influences students' learning, engagement, motivation, and overall success.