

## GLOSSARY OF TERMS

**Abstraction** - Abstraction in computational thinking enables us to navigate complexity and find relevance and clarity at scale. Decomposition and pattern recognition broke down the complex, and abstraction figures out how to work with the different parts efficiently and accurately. This process occurs through filtering out the extraneous and irrelevant to identify what's most important and connects each decomposed problem.

**Active Observer** - An individual who watches what happens in the group work, records, and reports the noticed interaction and behaviour of the group.

**Adaptive learning** - Adaptive learning is one technique for providing personalized learning, which aims to provide efficient, effective, and customized learning paths to engage each student. Adaptive learning systems use a data-driven approach to adjust the path and pace of learning, enabling the delivery of personalized learning at scale.

**Advanced Beginner** - After getting some experience in applying the rules in real situations, they begin to recognize situational elements that they need to consider from their actions.

**Agile** - The Agile methodology is a way to manage a project by breaking it up into several phases. It involves constant collaboration with stakeholders and continuous improvement at every stage.

**A production process** - A production process is the method of using economic input or resources, like labor, capital equipment or land, to provide goods and services to consumers.

**Blended Learning** - It combines online digital media with traditional classroom methods.

**Brainwork Assignment Preparation Checklist (n)** - A list of steps needed to be undertaken by the educator to prepare a comprehensive brainwork task.

**Case Study** - A process or record of research into the development of a particular person, group, or situation over a period of time. [Oxford languages, URL: <https://languages.oup.com/google-dictionary-en/>] A document which can be used in classrooms in the form of a "teaching" case study. The case method is a teaching approach that uses decision-forcing cases.

**Clickers** - Clickers are an interactive technology that enables instructors to pose questions to students and immediately collect and view the responses of the entire class. The system instantly collects and tabulates the results, which instructors can view, save, and (if they wish) display anonymously for the entire class to see.

**Coaching** - Coaching is a pedagogical technique that leads to a student-centric learning process where the teacher takes the role of a coach to co-create learning goals and facilitate the learning process.

**Co-coach** - A teacher with some experience on design thinking or innovation processes. He/she is a buddy teacher to the main course teacher.

**Co-curricular squads (n)** - Co-curricular clubs for singing, dancing, acting, photography, animation, sports, etc.

**Cognitive Reflections** - It is a questioning situation to compel a person to rethink and reflect on the acquired information and knowledge.

**Co-learning** - Co-learning aims at the collaborative construction of knowledge, in which co-learners are able to expand their social networks, integrate open learning with collective research and co-author collaborative productions.

**Collaborative Learning Activities / Intra-Group Discussion** - It is an environment to enhance the individual thinking ability in a group setting, following the group norms and social norms.

**Competent** - Independently fills & compiles the students' assessments following the set pattern or procedure and different tools and techniques used for the same. Can independently correct the notebooks of the students and frame the question paper as per the bloom's taxonomy.

**Competitive Debate** - In competitive debates, teams compete against each other and are judged the winner by a list of criteria that is usually based around the concepts of "content, style, and strategy".

**Computational thinking** - Computational thinking allows us to take a complex problem, understand what the problem is and develop possible solutions. We can then present these solutions in a way that a computer, a human, or both, can understand.

**Concept** - An abstract idea. A unit of knowledge created by a unique combination of characteristics (ISO 1087-1:2000, 3.2.1).

**Concept Formation** - A teaching strategy for gaining understanding of a notion (or idea) by studying, analysing, categorising a small set of examples of the concept.

**Daily Teaching Nib** - It is an academic tip which fosters Pre-Service and In-service teachers to use different pedagogies in their classrooms as a part of teacher's toolkit. This will help to enhance their teaching experience and will help in engaging the students in their classes positively.

**Decomposition** - The process of breaking down complex problems into smaller, more manageable parts. With decomposition, problems that seem overwhelming at first become much more manageable.

**Deduction** - The process of drawing logical conclusions that are specific in nature through the method of reasoning.

**Deep Learning** - Deep learning engages students as active members in knowledge-co creation, wherein students' skills and knowledge are simultaneously developed. The core skills that are developed include skills to learn-unlearn-relearn, communication skills, global citizenship, creativity, critical thinking.

**Design thinking** - Design thinking is a method to solve modern and wicked problems and challenges from the user's perspective. Wicked problems are complex problems that require creative and critical thinking skills to solve.

**Dictogloss** - It is a classroom dictation activity where learners are required to reconstruct a short text by listening and noting down key words, which are then used as a base for reconstruction.

**EduScrum** - EduScrum is a learner centric training program which includes group work and collective intelligence. It helps in learning strategies and optimize time spent in training. Its main benefit includes higher learner motivation as well as speeding the learning process.

**Entry Behaviour** - Entry behaviour includes the prerequisite knowledge, attitudes, or skills which the student already possesses that are relevant to the learning task or subject matter and that may be required to be demonstrated before beginning of the module.

**Experiential learning** - Learning by doing. The learning process where students learn by performing tasks practically and reflecting upon their experiences.

**Expert** - Expert's performance is marked by effortlessness and fluidity guided by intuition. Skills become part of experts. There is no need for conscious decision-making or problem-solving unless a novel situation is encountered.

**Evaluation** - It is the third stage of FIESI Model which involves the critical thinking to evaluate creatively generated ideas generated through ideation to make it feasible.

**FIESI Model** - FIESI Model is designed to develop productive thinking ability that combines creative thinking and critical thinking.

**Formative Debate** - A flexible teaching strategy where a teacher or a group of teachers can adopt debate within their lesson as an educational tool. The arguments and themes of the debate must touch back on course themes, and students must base their arguments on course materials as well as their own research to be effective.

**Foundation** - It is the first stage of FIESI Model in which the teacher motivates students to get engaged in the content by manipulating their prior understanding and teach them with the help of student centric strategies like, activities, demonstration, and teaching with technology.

**Global skills** - Global skills are those skills that enable us to operate in an international context. These skills include cultural awareness, language and communication skills, international commercial awareness and networking. Global skills encourage sensitivity to the needs of others, problem-solving, and how to communicate effectively with those from different cultures.

**Group Conduct Document** - It is a document drafted collaboratively by the team that has all the principles that the team members can use to distinguish right from wrong — it is a written collection of rules, principles, values, expectations, and behavior that the team considers fundamental to their success.

**Group Process** - Group process refers to how team members work together to get things done.

**Head and Tails** - A title of a tool for the development of critical thinking which is based on the activity of coin flipping; a head is the front side of a coin; a tail is the backside of a coin. This tool serves as a dynamic and functional tool for enhancing students' critical thinking.

**High-impact experience** - An educational experience in which students actively pose and solve problems, work collaboratively in a community of peers, experience real-world applications of knowledge, and reflect on their own learning processes.

**Ideation** - The second stage of FIESI Model is the ideation. It emphasizes creative thinking with the help of strategies like, creative writing, SCAMPER, cognitive questions, and brainstorming.

**Implication** - It is the fifth stage of the FIESI model where the created ideas are implied in real life situations to get value from it.

**Inclusive (adj.)** - Including or taking everything into account.

**Inductive thinking** - In inductive reasoning, we begin with specific observations and measures, begin to detect patterns and regularities, formulate some tentative hypotheses that we can explore, and finally end up developing some general conclusions or theories.

**Industry 4.0 (n)** - Also called the Fourth Industrial Revolution, the term refers to the idea of the cyber-physical transformation of manufacturing.

**InnoFlash Process** - During the JAMK InnoFlash course, students solve real working life problems in multidisciplinary student teams. It's part of JAMK mandatory course work. In The Innoflash course, the students are required to apply their 21st century skills.

**INSERT Method** - INSERT method (Interactive Noting System Effective Reading and Thinking) – founded by Vogan and Estes developing critical thinking ability in reading scientific texts. This method visualizes the process of knowledge accumulation from known information to the new one. Student can mark text or information as following: “v” – already know, “+” – new information, “-” – had another idea, “?” – unclear, and needs to be clarified.

**Instructional Aids** - Any material or device used to assist the teacher in preparation and presenting the lesson and facilitating the learning of the students.

**Inter Group Sharing** - Sharing of information among different groups for the purpose of developing creative and critical thinking.

**Intersubjectivity** - Intersubjectivity is the process wherein two participants begin a task with different understanding and arrive at a shared understanding.

**Iterative** - Iteration is the repetition of a process to generate a sequence of outcomes.

**Kolb's learning cycle** - Kolb's learning cycle is a transformational learning process that involves four stages, namely: concrete learning, reflective observation, abstract conceptualization, and active experimentation.

**Learner autonomy** - A condition of taking responsibility and being accountable for one's learning, focusing on the goal one needs to achieve, being actively involved, taking individual decisions according to one's necessities and preferences.

**Learners' preparedness** - A state of being ready to make decisions with reference to the previously gained knowledge.

**Level playing field (n)** - A situation where everyone has a fair and equal chance to succeed.

**Long-term memory** - Long-term memory consists of memories that the brain has stored over an extended period of time. These memories can be from an hour ago or from decades earlier.

**Lotus Blossom method** - The Lotus Blossom Technique is a structured brainstorming exercise used to expand on a central idea or problem. Teams place the original problem statement in the center box in a 3x3 matrix, then add related themes or elements of the

problem in the 8 boxes surrounding it. [<https://thoughtegg.com/lotus-blossom-creative-technique/>]

**MAX** - MAX is an acronym that stands for the three steps of the teaching framework: Motivation, Acquisition, and Extension. It is a tool to develop students' analytical and reflection skills when analysing, synthesizing, and evaluating the information obtained.

**Model of Productive Thought of Douglas P. Newton (2017)** - It is a structured approach of solving problems or generating creative ideas.

**Muddy cards** - It involves – finding the “muddiest” point of the lecture – students give feedback to analyze, increase learning retention and determine gaps in their comprehension – students are asked to reflect what they have learned - they write down the most unclear points of the lecture. The instructor may correct misconceptions by the next class or use the cards in seminars.

**Multiculturalism** - Multiculturalism describes the way a given society deals with cultural diversity.

**Multidisciplinary (adj.)** - Merging or involving various academic disciplines or subjects.

**Multi-perspective Teaching (n)** - An educational approach that considers different perspectives of learners.

**Natural semantic categories** - The combination of a set of semantic primes each representing a different basic concept, residing in minds with a propensity to acquire certain basic concepts, and a common set of rules for combining those concepts into meaningful messages, constitutes a natural semantic concept.

**Novice** - The novice's actions are guided by rules and a set of objective facts and features related to the skills. There is little consideration for the context of the actions.

**Open Book Environment** - An open book environment helps students to acquire new knowledge, to solve problems and make intelligent decisions. It helps students to perform well in the Open Book Examination.

**Open Book Examination** - An assessment practice wherein students are allowed to refer either to class notes or a memory aid or a textbook, or any other approved material while answering questions.

**Open Ended Instructions** - Open-ended tasks have more than one right answer, solution or outcome and can be completed in more than one way. They can take the form of statements, questions, tasks, projects, or teaching methods. Different learners may use different types of thinking; and there are no predetermined correct outcomes.

**Pattern recognition** - Pattern recognition means recognizing patterns. Specifically, with computational thinking, pattern recognition occurs as people study the different decomposed problems.

**Pedagogy** - Pedagogy helps in deciding the teaching strategies, teacher actions and decisions by taking into consideration theories of learning, understanding of students and their needs, and the backgrounds and interests of individual students.

**Peer Teaching** - It is a method of teaching, where a student teaches another student, wherein the former will be an expert and the latter a novice. This is based on the belief that “To teach is to learn twice” (Collins).

**Perspective (n)** - A particular way of regarding or viewing things, based on one's experiences, likes, or dislikes.

**Phenomenon** - A fact or situation that is observed to exist or happen, especially one whose cause or explanation is in question.

**Productive Thinking** - It is the cognitive ability of solving problems through a process of combining creative thinking and critical thinking.

**Proficient** - This stage is marked by the emergence of intuitions or know-how (procedural knowledge). Proficient performers are able to act without conscious deliberation since they can recall similar situations in the past and the course of actions taken that were proved effective.

**Psychomotor Domain** - The psychomotor domain includes physical movement, coordination, and use of the motor-skill areas. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution.

**Questions of Cognitive Conflicts** - It is a questioning situation to create conflict on the acquired information and knowledge for the purpose of compelling a person to think.

**Reflection theory** - Critical analysis and evaluation of one's learning experiences.

**Reflective learning** - Reflective learning involves students thinking about what they have read, done, or learned, relating the lesson at hand to their own lives and making meaning out of the material. It's more than just memorizing some facts, formulas, or dates.

**Reinforcement** - Reinforcement is used to help increase the probability that a specific behaviour will occur in the future by delivering or removing a stimulus immediately after a behaviour.

**Reproductive thinking** - Reproductive thinking is associated with chained behavior or repetition and ultimately leads to rote learning.

**Research (n)** - The in-depth or thorough study of a subject.

**Rote-memorisation (n)** - The process of memorising information on the basis of repetition.

**Scaffolding** - Refers to the successive levels of temporary support provided to the In-service teacher and pre-service teacher that helps them to reach higher levels of comprehension and skill acquisition that In-service teacher and pre-service teacher would not be able to achieve without assistance.

**Seating plan (n)** - (here) A diagram or a set of spoken or written instructions that directs where students should take their seats.

**Short-term memory** - Short-term memory, also known as primary or active memory, is the capacity to store a small amount of information in the mind and keep it readily available for a short period of time.

**SMART goals (n)** - Goals that are Specific, Measurable, Attainable, Relevant, and Time-Bound.

**Socio-pragmatic skills** - Socio-pragmatic strategies are those based on social and cultural considerations that are needed for comprehending any piece of discourse and the related speech acts including politeness issues, gendered language use, the nature of power relations, and distance.

- Sprint** - The heart of eduScrum is a sprint, a composite set of learning materials that ensure that the learning objectives are achieved. A sprint can be a context-rich lesson series, a project, a chapter from a book and so on. In general, a sprint will coincide with the length of a semester or period, although this is not a requirement. A sprint has a pre-set time box (period) of approximately seven weeks.
- Stabilization** - It is the fourth stage of FIESI Model that helps students in stabilizing the concepts acquired through the previous stages of the model.
- Student-led recitations** - Student-led recitations (Ticking) – appropriate for use in teaching problem solving, first used at Royal Institute of Technology (KTH) in Stockholm. For weekly recitation sessions students are asked to work through a set of problems. At session students tick on the list which problems they are prepared to present, solve, explain, and lead the classroom discussion. Students need to tick at least 75% of problems to pass the course. Students spend time on tasks, are active, reflect on how to explain the methods and argue on problem-solving strategies.
- SWOT analysis** - A SWOT analysis is a technique for assessing four aspects (Strengths, Weaknesses, Opportunities, and Threats) of your process, project, organization, or personality.
- Teachers' Excel Sheet** - A quarterly e-newsletter dedicated to sharing resources in teaching, pedagogies, learning and assessment.
- TEAL** - Technology-enabled active learning is a teaching format that merges lectures, simulations, and hands-on desktop experiments to create a rich collaborative learning experience. It can be categorised as Soft Teal and Hard Teal.
- TED-Talk** - Eight-minute video-recorded speech on different topics.
- Thinkx Model of Tim Hurson (2007)** - The Productive Thinking Model (thinkx), developed by Tim Hurson, is a structured approach to solving problems or generating creative ideas.
- Value creation pedagogy** - Value creation pedagogy is when teachers let their students learn by applying their competencies (future or existing) to create something of value to at least one external stakeholder outside their own group, class, or school. The value that students create may be social, economic, or cultural.
- Visual diagrams** - Includes mind map, Fishbone diagram, Venn's diagram, etc. These methods help to develop students' analytical and critical thinking abilities and reflection.
- Vocational inclinations (n)** - Strong dispositions to follow a specific career or activity.
- WSD** - World School Debate format, one of the most common competitive formats generally adopted in international tournaments and olympiads.
- ZPD** - Zone of Proximal Development is defined as the difference between Pre-service and In-service teacher's actual skill level as determined by independent teaching and the Pre-service and In-service teacher's potential skill level as determined through hand holding and in collaboration with more capable peers.