# The What and Why of EdTech
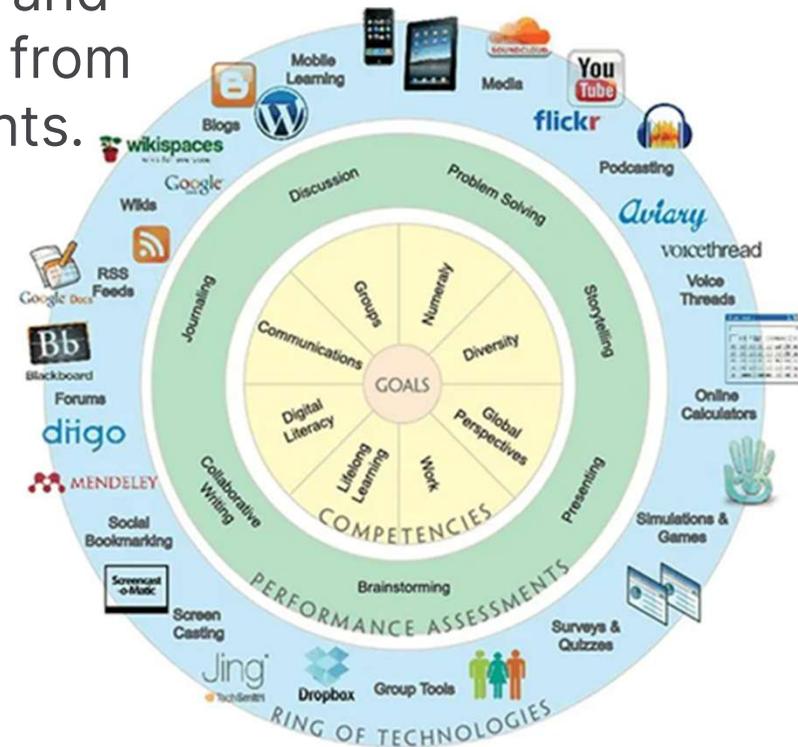
# EdTech

Education Technology, often abbreviated as EdTech, refers to **the use of technology to improve teaching and learning**.

It encompasses a wide range of tools, applications, and resources that can be used in educational settings, from traditional classrooms to online learning environments.

EdTech **integrates computer hardware, software, and educational theory and practice to facilitate learning**, and it often refers to the industry of companies that create educational technology.

**EdTech**

integrates computer hardware, software, and ==educational theory and practice to facilitate learning –== <span style="color:red">**Baked In**</span>
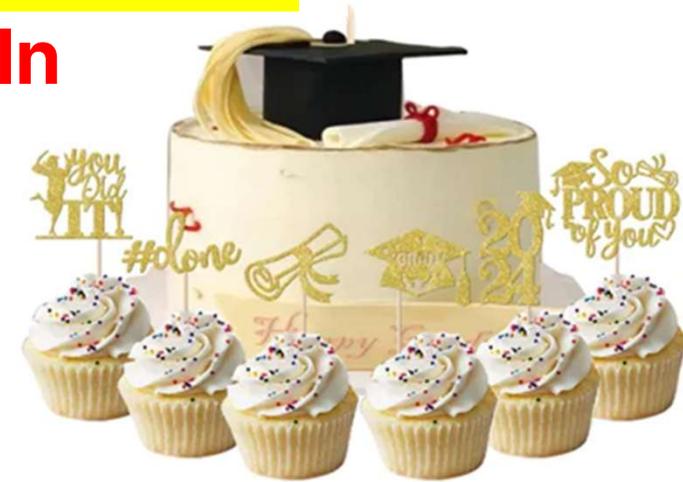
## Khan Academy
- **Teaching Principle**: Personalization and Adaptive Learning

## Padlet
- **Teaching Principle**: Collaborative Learning and Brainstorming

## Google Classroom
- **Teaching Principle**: Used when Identifying Desired Learning Outcomes first – Backwards Design

# instructional design issues and the **theories of human learning**

- **Behaviourism** is based on the idea that knowledge is independent and on the exterior of the learner. To a behaviourist, the learner is a blank slate that should be provided with the information to be learnt

- **Cognitivism** focuses on the idea that students process information they receive rather than just responding to a stimulus, as with behaviourism. Learning occurs when the student reorganizes information, either by finding new explanations or adapting old ones.

- **Constructivism** is based on the premise that we construct learning new ideas based on our own prior knowledge and experiences. Learning, therefore, is unique to the individual learner.
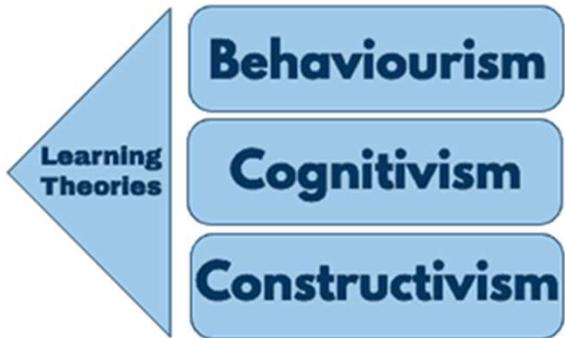
- **Behaviorism** **emphasizing the importance of clear, observable outcomes and measurable progress**
  - ClassDojo[1], Hero K12, Duolingo, Kahoot

- **Cognitivism** **students construct knowledge through experiences and reflection**
  - Popplet, Khan Academy, Mindmaps
  - Building databases, spreadsheets, expert systems, multimedia/hypermedia construction, and interactive apps

- **Constructivism** **support active learning, collaboration, and the construction of knowledge through experience**
  - Scratch, Google Classroom, UDL aligned tools (Powerpoint, Canva, Kami, Hypothesis.is)
  - discussion forums, collaborative projects, and virtual simulations

[1]https://hackeducation.com/2017/12/23/top-ed-tech-trends-social-emotional-learning

Universal Design for Learning (UDL) is a framework for designing learning experiences so that students have options for how they learn, what materials they use, and how they demonstrate their learning.
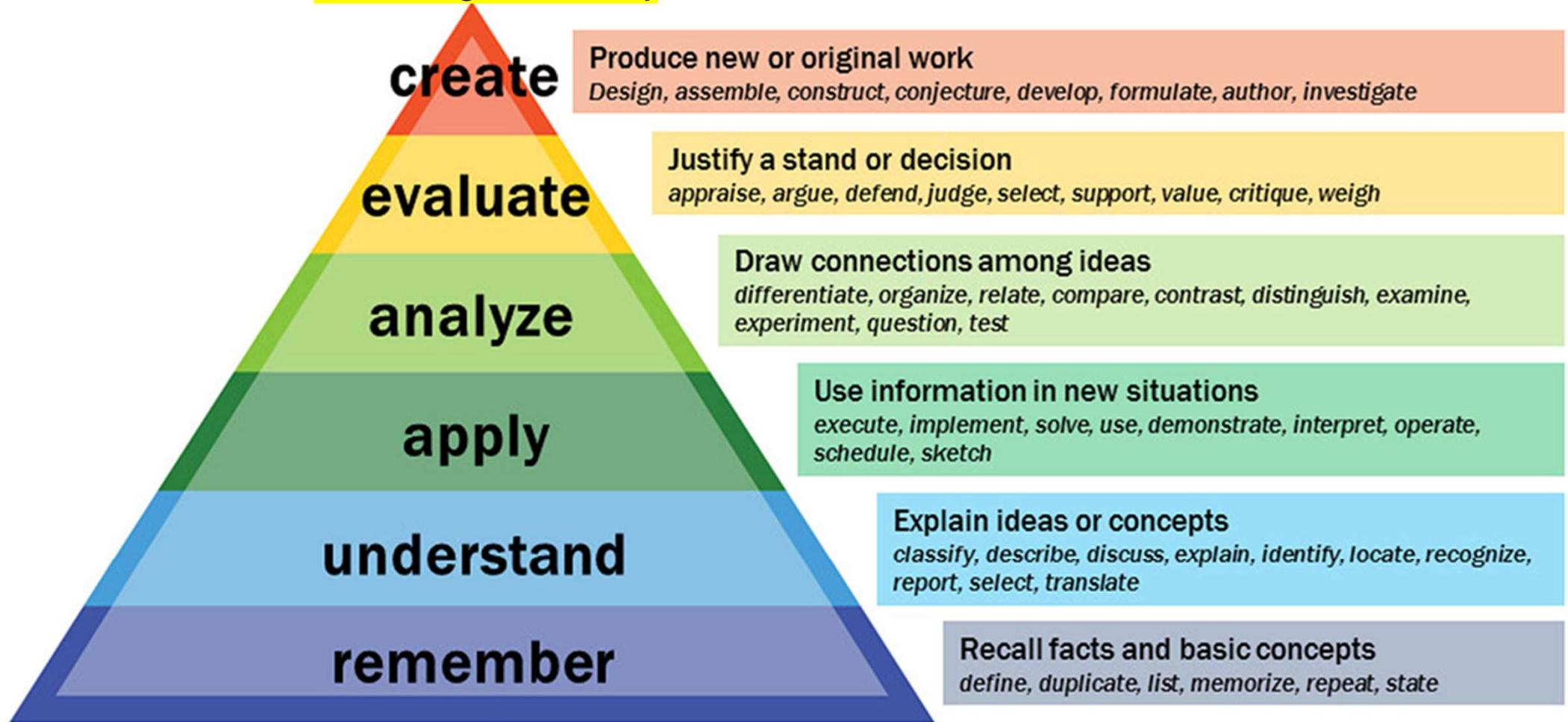
- Digital audiobook platforms
  - Audible, Libro.fm
- Multimedia presentation tools
  - Google Slides, Powerpoint, Canva, iMovie
- Digital annotation tools
  - Kami, Hypothesis.is



The UDL Guidelines

Originally developed in 1956 by Benjamin Bloom, has been revised and adapted to include digital learning objectives and activities, known as Bloom's Digital Taxonomy

# Bloom's Taxonomy

**create**
Produce new or original work
*Design, assemble, construct, conjecture, develop, formulate, author, investigate*

**evaluate**
Justify a stand or decision
*appraise, argue, defend, judge, select, support, value, critique, weigh*

**analyze**
Draw connections among ideas
*differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test*

**apply**
Use information in new situations
*execute, implement, solve, use, demonstrate, interpret, operate, schedule, sketch*

**understand**
Explain ideas or concepts
*classify, describe, discuss, explain, identify, locate, recognize, report, select, translate*

**remember**
Recall facts and basic concepts
*define, duplicate, list, memorize, repeat, state*

1990s, the taxonomy was updated to
use active verbs: remember, understand, apply, analyze, create, and evaluate.
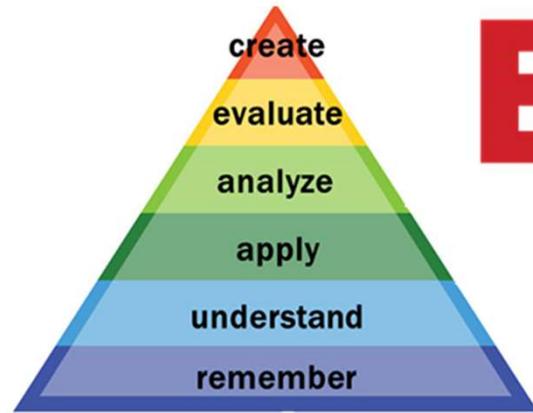
Educational technology tools can help educators apply Bloom's Taxonomy by assisting with the creation of clear and measurable learning objectives, designing instructional strategies, and creating effective assessments

Bloom's Digital Taxonomy extends the original framework to include activities suitable for eLearning or online training initiatives, incorporating verbs and tasks that are relevant to digital learning environments

2008 Andrew Churches

# BLOOM'S DIGITAL TAXONOMY VERBS

Bloom's Digital Taxonomy is about using technology and digital tools to facilitate learning. This kind of student engagement is defined with power verbs that can be used for everything from lesson planning and rubric making, to doing curriculum mapping and more.

You can use these verbs which cover the span of the taxonomy from LOTS (lower-order thinking skills) to HOTS (higher-order thinking skills). It begins with *Remembering* and ends with *Creating*. Listed beneath are the power verbs that apply to each stage.

← **LOTS**          **HOTS** →

## REMEMBERING

Remembering is when memory is used to produce definitions, facts, or lists or to retrieve information.

## UNDERSTANDING

Understanding is all about constructing meaning from many different types of functions, be they written or graphic.

## APPLYING

Applying refers to situations where the learned material is used in products such as diagrams, models, interviews, simulations, and presentations.

## ANALYZING

Analyzing is about breaking materials into parts, and then determining how the parts interrelate to each other or to an overall structure or purpose.

## EVALUATING

Evaluating is about making judgements based on criteria and standards through checking and critiquing.
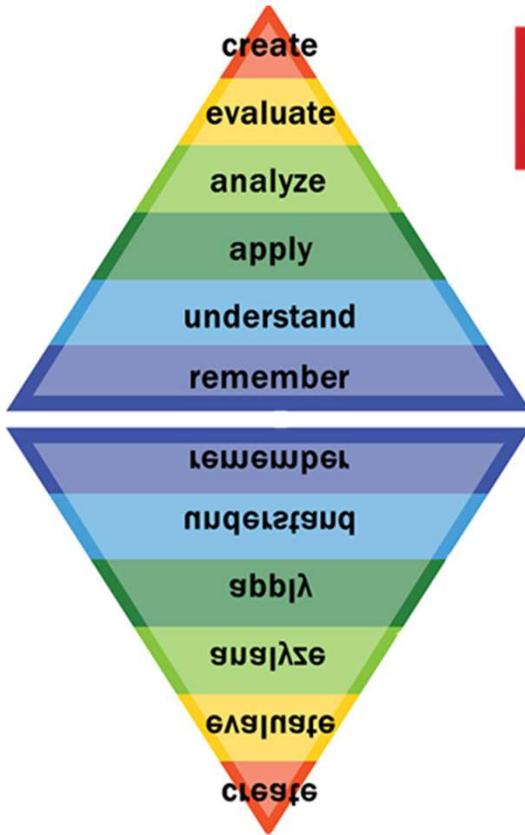
## CREATING

Creating is about combining elements to form a whole, and also reorganizing elements into new structures or patterns by planning and producing.

| Remembering | Understanding | Applying | Analyzing | Evaluating | Creating |
|---|---|---|---|---|---|
| Copying | Annotating | Acting out | Calculating | Arguing & | Blogging |
| Defining | Tweeting | Articulate | Categorizing | Debating | Building |
| Finding | Associating | Reenact | (e.g., web | Validating | Animating |
| Locating | Tagging ( | Loading | content, search | Testing | Adapting |
| Quoting | search results, | Choosing | results, etc.) | Scoring | Collaborating |
| Listening | curriculum) | Determining | Breaking Down | Assessing | Composing |
| Googling | Summarizing | Displaying | Correlating | Criticizing | Directing |
| Repeating | Relating | Revising | Deconstructing | Commenting | Devising |
| Retrieving | Categorizing | Search | Strategic | Iterating or | Podcasting |
| Outlining | Paraphrasing | Keywords | Hyperlinking | Pivoting (e.g., | Wiki Building |
| Highlighting | Predicting | Executing | Supporting | startup, app) | Writing |
| Memorizing | Comparing | Examining | (e.g., a cause) | Defending | Filming |
| Networking | Contrasting | Implementing | Mind-Mapping | Detecting | Programming |
| Searching | Commenting | Sketching | Organizing | Experimenting | Simulating |
| Identifying | Journaling | Experimenting | Appraising | Grading | Role-Playing |
| Selecting | Interpreting | Hacking | Advertising | Hypothesizing | Solving |
| Tabulating | Grouping | Interviewing | Dividing | Judging | Remixing |
| Duplicating | Inferring | Painting | Deducing | Moderating | Facilitating |
| Matching | Estimating | Preparing | Distinguishing | Posting | Designing |
| Curating & | Extending | Playing | Illustrating | Predicting | (e.g., a |
| Bookmarking | Gathering | Integrating | Questioning | Rating | presentation |
| Bullet-pointing | Exemplifying | Presenting | Structuring | Reflecting | website, |
|  | Expressing | Charting | Integrating | Reviewing | document, |
|  |  |  | Attributing | (service, app, | image) |
|  |  |  | Estimating | platform, etc.) | Negotiating |
|  |  |  | Explaining | Editorializing | Leading |

## Bloom's Digital Taxonomy

- **Remember** — bookmark, google, link, search

- **Understand** — annotate, Boolean search, journal, tweet

- **Apply** — chart, display, execute, present, upload

- **Analyze** — attribute, deconstruct, illustrate, mash, mind map

- **Evaluate** — comment, editorialize, moderate, network, post

- **Create** — blog, film, integrate, podcast, program, publish
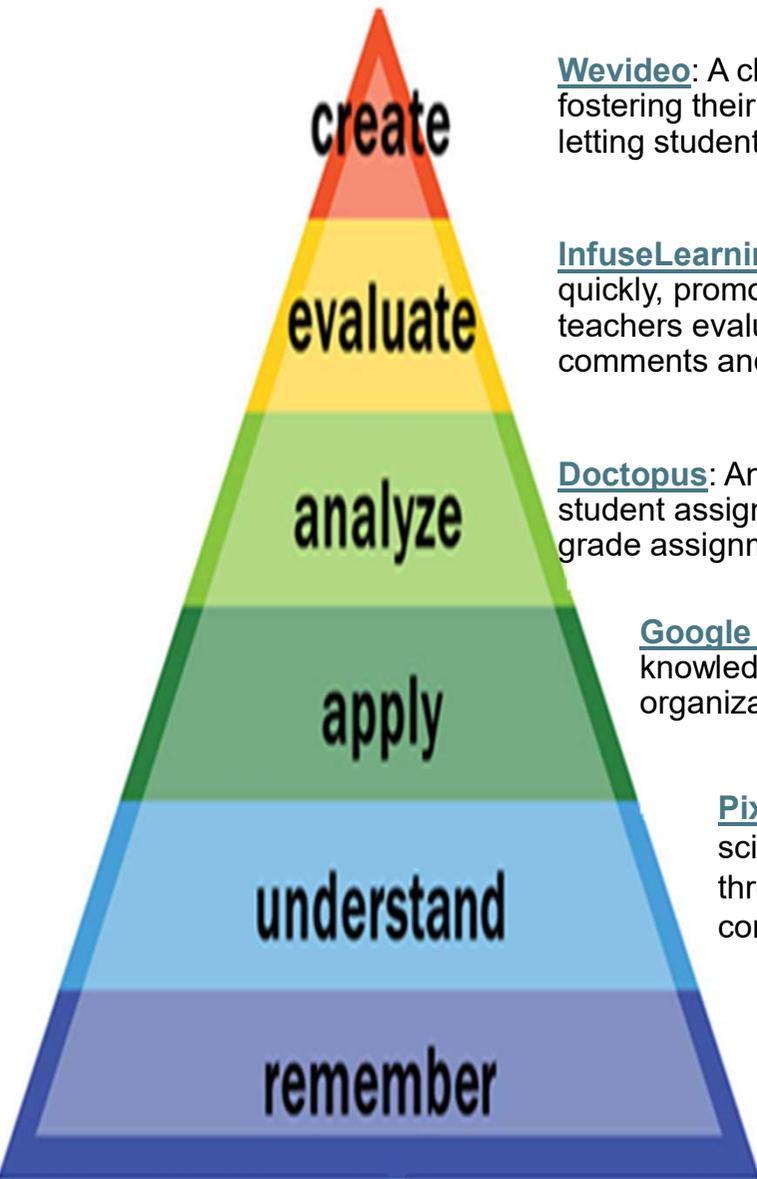
**Wevideo**: A cloud-based video editing platform that allows students to create high-quality videos, fostering their creative skills. **StoryboardThat**: Offers a fun way to integrate creativity into learning by letting students create their own storyboards.

**InfuseLearning**: This is an interactive classroom tool that allows teachers to create assessments quickly, promoting critical evaluation skills. **Socrative**: A real-time feedback tool, Socrative helps teachers evaluate student comprehension and adapt instruction accordingly. **Kaizena**: Allows for voice comments and feedback on Google Docs, enabling a richer evaluation of student work.

**Doctopus**: An extension for Google Sheets that allows for more granular distribution and tracking of student assignments. **Online Rubric**: Designed for the Google environment, these tool make it easier to grade assignments analytically.

**Google Slides**: Ideal for collaborative projects, Google Slides enables real-world application of knowledge. **MindMeister**: This mind mapping tool encourages the application of concepts through visual organization.

**Pixton**: Enables the creation of comics to demonstrate understanding of topics, from literature to science. **Thinglink**: Adds an interactive layer to images or videos, enhancing understanding through multimedia. **Edublogs**: A blogging platform specifically for education, great for enhancing comprehension and written expression

**SeeSaw**: A digital portfolio that enables students to showcase and reflect upon their work. **Wunderlist**: A simple yet powerful task management tool that helps students remember tasks and deadlines. **Diigo**: A social bookmarking website that helps in collecting, annotating, and remembering useful web resources.

**EdTech**

**Certain Tools may be more useful to the subject being taught**

## Physics
- **Nearpod, PhET Interactive Simulations, KerbalEdu (Kerbal Space Program)**

## Chemistry
- **NOVA elements, ChemTools, Wolfram Alpha**

## Biology
- **BioED Online, The Biology Corner, NOVA Labs Biology**

## Mathematics
- **Geobra, Maths-Whizz, ConquerMath**

# Some Videos (if we have time)

- Phet  https://youtu.be/0Xgs636-fA8?t=17

- Khan Academy  https://www.youtube.com/watch?v=Ewf7RlVNB

- Geobra  https://www.youtube.com/watch?v=CgWypDdAC4Q&list=PLI7

- Scratch  https://www.youtube.com/watch?v=eAJ3AS76ZLo

Benjamin S. Bloom

Bell Curve Distribution

CONVENTIONAL
1-30*

MASTERY LEARNING
1-30*

TUTORIAL
1-1*

Summative Achievement Scores

*Teacher-student ratio

June/July 1984

**1** CONVENTIONAL
1 Teacher 30 Students
Tests & Feedback

**2** MASTERY
1 Teacher 30 Students
Tests & Feedback &
Corrective Procedures

**3** TUTORIAL
1 Teacher 1 Students
Tests & Feedback &
Corrective Procedures

# 2 Sigma Problem

- Most students have potential to reach high level of learning
- 'C' students typically capable of achieving grade 'A' results when 1-on-1

**Highlights these needs**

- Material tailored to specifically to a student's need
- Feedback for corrective actions immediate

**Problems**

- Needs Resources to engage at pace and level of each student
- How to achieve Student Centred Learning with feedback timely to individual needs

**Strategies**

- Active learning
- Flipped Classes
- Interactive Tools (EdTECH) streamline & Online assessment

**ED TECH® CONNECT**

**Legend:**
- Emerging Technology
- Network & Infrastructure
- Student Success
- Marketing & Communication
- Organizational Effectiveness
- Teaching & Learning
- Digital Experience & Accessibility
- Security

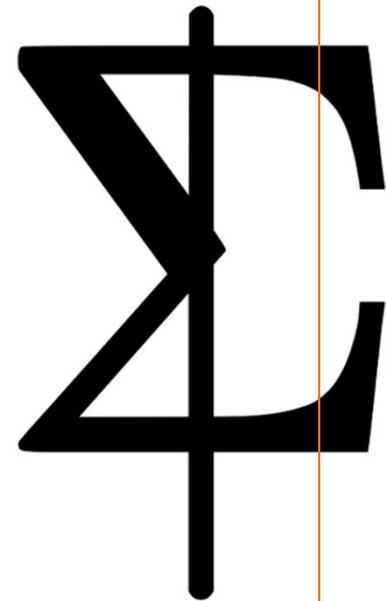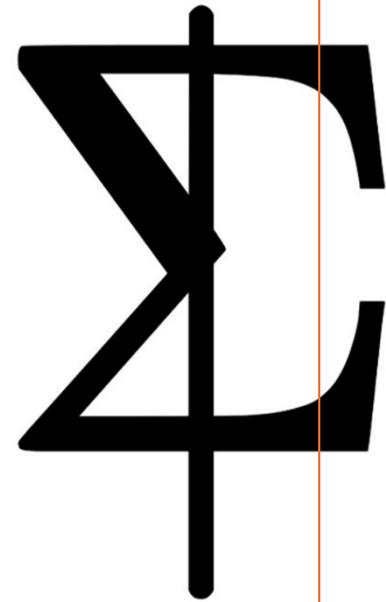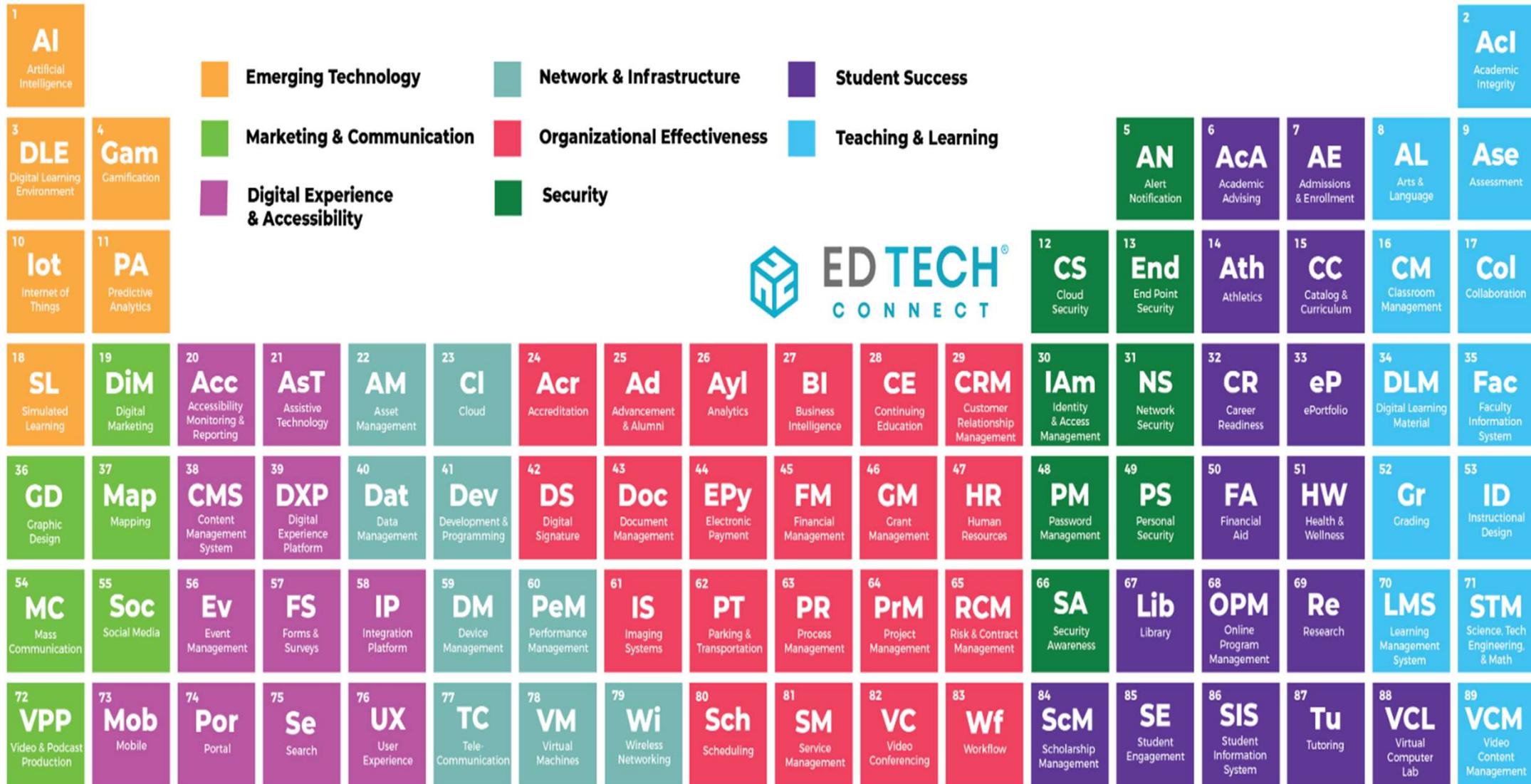| # | Symbol | Name |
|---|--------|------|
| 1 | AI | Artificial Intelligence |
| 2 | AcI | Academic Integrity |
| 3 | DLE | Digital Learning Environment |
| 4 | Gam | Gamification |
| 5 | AN | Alert Notification |
| 6 | AcA | Academic Advising |
| 7 | AE | Admissions & Enrollment |
| 8 | AL | Arts & Language |
| 9 | Ase | Assessment |
| 10 | Iot | Internet of Things |
| 11 | PA | Predictive Analytics |
| 12 | CS | Cloud Security |
| 13 | End | End Point Security |
| 14 | Ath | Athletics |
| 15 | CC | Catalog & Curriculum |
| 16 | CM | Classroom Management |
| 17 | Col | Collaboration |
| 18 | SL | Simulated Learning |
| 19 | DiM | Digital Marketing |
| 20 | Acc | Accessibility Monitoring & Reporting |
| 21 | AsT | Assistive Technology |
| 22 | AM | Asset Management |
| 23 | Cl | Cloud |
| 24 | Acr | Accreditation |
| 25 | Ad | Advancement & Alumni |
| 26 | Ayl | Analytics |
| 27 | BI | Business Intelligence |
| 28 | CE | Continuing Education |
| 29 | CRM | Customer Relationship Management |
| 30 | IAm | Identity & Access Management |
| 31 | NS | Network Security |
| 32 | CR | Career Readiness |
| 33 | eP | ePortfolio |
| 34 | DLM | Digital Learning Material |
| 35 | Fac | Faculty Information System |
| 36 | GD | Graphic Design |
| 37 | Map | Mapping |
| 38 | CMS | Content Management System |
| 39 | DXP | Digital Experience Platform |
| 40 | Dat | Data Management |
| 41 | Dev | Development & Programming |
| 42 | DS | Digital Signature |
| 43 | Doc | Document Management |
| 44 | EPy | Electronic Payment |
| 45 | FM | Financial Management |
| 46 | GM | Grant Management |
| 47 | HR | Human Resources |
| 48 | PM | Password Management |
| 49 | PS | Personal Security |
| 50 | FA | Financial Aid |
| 51 | HW | Health & Wellness |
| 52 | Gr | Grading |
| 53 | ID | Instructional Design |
| 54 | MC | Mass Communication |
| 55 | Soc | Social Media |
| 56 | Ev | Event Management |
| 57 | FS | Forms & Surveys |
| 58 | IP | Integration Platform |
| 59 | DM | Device Management |
| 60 | PeM | Performance Management |
| 61 | IS | Imaging Systems |
| 62 | PT | Parking & Transportation |
| 63 | PR | Process Management |
| 64 | PrM | Project Management |
| 65 | RCM | Risk & Contract Management |
| 66 | SA | Security Awareness |
| 67 | Lib | Library |
| 68 | OPM | Online Program Management |
| 69 | Re | Research |
| 70 | LMS | Learning Management System |
| 71 | STM | Science, Tech Engineering, & Math |
| 72 | VPP | Video & Podcast Production |
| 73 | Mob | Mobile |
| 74 | Por | Portal |
| 75 | Se | Search |
| 76 | UX | User Experience |
| 77 | TC | Tele-Communication |
| 78 | VM | Virtual Machines |
| 79 | Wi | Wireless Networking |
| 80 | Sch | Scheduling |
| 81 | SM | Service Management |
| 82 | VC | Video Conferencing |
| 83 | Wf | Workflow |
| 84 | ScM | Scholarship Management |
| 85 | SE | Student Engagement |
| 86 | SIS | Student Information System |
| 87 | Tu | Tutoring |
| 88 | VCL | Virtual Computer Lab |
| 89 | VCM | Video Content Management |

■ Emerging Technology
■ Network & Infrastructure
■ Student Success

■ Marketing & Communication
■ Organizational Effectiveness
■ Teaching & Learning

■ Digital Experience & Accessibility
■ Security

**ED TECH®**
**CONNECT**

| 4 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Gam** Gamification | | | | | | | | | | | |

| 11 | | | | | | | | | | | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **PA** Predictive Analytics | | | | | | | | | | | **CS** Cloud Security |

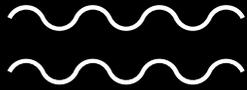| 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DiM** Digital Marketing | **Acc** Accessibility Monitoring & Reporting | **AsT** Assistive Technology | **AM** Asset Management | **Cl** Cloud | **Acr** Accreditation | **Ad** Advancement & Alumni | **Ayl** Analytics | **BI** Business Intelligence | **CE** Continuing Education | **CRM** Customer Relationship Management | **IAm** Identity & Access Management |

# Software/Tools in Cambodian High Schools

## (Dr Im Keun)

**Programming and Coding Frameworks**
- Skratch, Python, Blockly, Code.org

**STEM Simulation and Modeling Tools**
- Phet, GeoGebra, MathLAB, Autodesk Tinkercad

**AI and Machine Learning**
- Google Teachable Machine, Tensorflow.js, IBM Watson Studio

**Collaborative and Project-Based Learning Tools**
- Google Workspace for Education, MS Teams (one note & Office 365), Padlet

**Game-Based Learning and Gamification Tools**
- Minecraft: Education Edition. Kahoot!, Quizlet

**Data Analysis & Visualization**
- Excel, PowerBI, Tableau Public, Python

**Robotics and Physical Computing Frameworks**
- Arduino, Rasberry Pi, Lego Mindstorms

**Creative and Multimedia Tools**
- Adobe Creative Cloud (Photoshop, Premiere Pro, Spark), Canva, Audacity

**Learning Management Systems (LMS)**
- Google classroom, Canvas, Schoology

- **Content Authoring Platforms**: These tools allow you to create self-paced, asynchronous courses and training materials. They often feature a "What You See Is What You Get" (WYSIWYG) user interface for ease of use.
    - •**Articulate Storyline**: A powerful tool for creating interactive eLearning courses with multimedia elements.
    - •**Adobe Captivate**: Used for creating eLearning content, including simulations and software demonstrations.
    - •**Lectora Inspire**: A comprehensive tool for designing and developing eLearning courses, including quizzes and assessments.

•**Learning Management Systems (LMS)**: These platforms manage and deliver educational content, track student progress, and facilitate communication.
  - •**Moodle**: An open-source LMS that supports a wide range of educational activities and assessments.
  - •**Canvas**: A user-friendly LMS that integrates with various educational tools and provides robust analytics.
  - •**Blackboard**: A comprehensive LMS used by many educational institutions for course management and student engagement.
  - **SCORM -**Sharable Content Object Reference Model
    - –File Format Standard Storing LMS
    - -LMSs communicate/share with each other

- **Assessment and Feedback Tools**: These tools help educators create and manage assessments, provide feedback, and track student performance.
    - **Kami**: Allows teachers to upload and annotate documents online, making it easy to provide detailed feedback and collaborate with students.
    - **EdPuzzle**: Enables teachers to create interactive video lessons with quizzes and audio recordings, and track student progress.
    - **Quizlet**: Provides access to a massive library of study materials and practice tests, with real-time progress tracking.
- **Interactive Presentation Tools**: These tools enhance classroom presentations by making them more engaging and interactive.
    - **Pear Deck**: Integrates with Google Slides to create interactive presentations with polls, quizzes, and real-time student engagement.
    - **Nearpod**: Allows teachers to create interactive lessons with quizzes, virtual field trips, and real-time assessments.
- **Collaboration and Communication Tools**: These tools facilitate collaboration and communication among students and between students and teachers.
    - **Google Classroom**: A platform that helps teachers and students communicate, organize assignments, and share resources.
    - **Microsoft Teams**: A collaboration tool that supports video meetings, file sharing, and chat.
    - **Flip**: A video-based platform for interactive conversations and discussions.

- **Video Creation and Editing Tools**: These tools help educators create and edit video content for educational purposes.
    - **Screencastify**: Enables teachers to record their screens for tutorials, lessons, and presentations, with robust editing features.
    - **Camtasia**: A comprehensive tool for creating and editing video content, including screen recordings and video tutorials.
    - **Loom**: A simple tool for creating and sharing video messages and screen recordings.
- **Mind Mapping and Brainstorming Tools**: These tools help organize ideas and concepts visually.
    - **Lucidchart**: A web-based application for creating and collaborating on diagrams and flowcharts.
    - **Bubbl.us**: Allows users to create engaging concept maps and notes, reducing distractions and increasing focus.
- **Multimedia Creation Tools**: These tools help create and manage multimedia content, including images, audio, and video.
    - **Canva**: A design tool for creating graphics, presentations, and other visual content.
    - **Adobe Spark**: A suite of tools for creating videos, graphics, and web pages.
    - **Book Creator**: Allows educators to create, design, and publish multimedia stories, including images, text, and audio.

- **Social and Emotional Learning (SEL) Tools**: These tools focus on developing students' social and emotional skills.
    - **Headspace**: A meditation and mindfulness tool that helps students manage stress and emotions.
    - **ClassDojo**: A communication platform that helps build positive classroom cultures and supports SEL.
- **Game-Based Learning Tools**: These tools use games to make learning more engaging and fun.
    - **Kahoot**: A gamification tool for creating quizzes and surveys that keep students engaged.
    - **Prodigy**: A game-based educational platform that helps students learn math and reading skills.
    - **MangaHigh**: Offers a wealth of resources for game-based learning in mathematics.

# Discussion Topics & Interactive Demo

# Thank you!