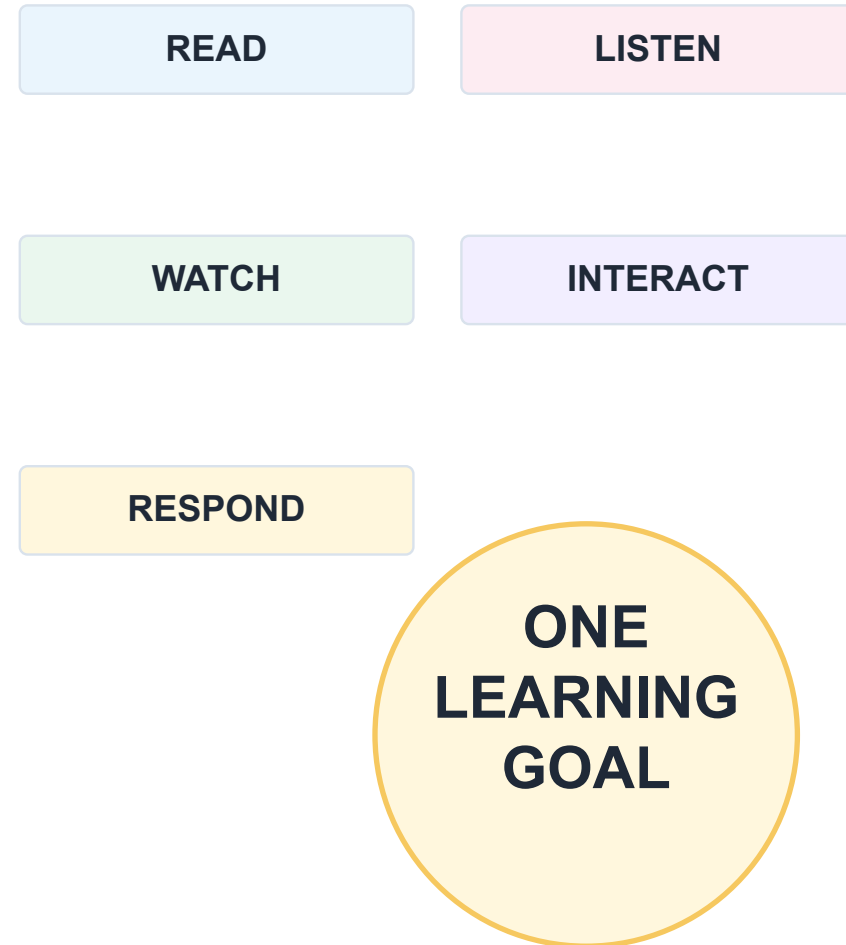


Universal Design for Learning

Designing digital learning for learner variability



Same goal → different pathways

One Lesson. Many Learners.

Prior knowledge

Learners vary naturally.

Language

Learners vary naturally.

Pace

Learners vary naturally.

Interests

Learners vary naturally.

Attention

Learners vary naturally.

Confidence

Learners vary naturally.

Ways of communicating

Learners vary naturally.

Access to technology

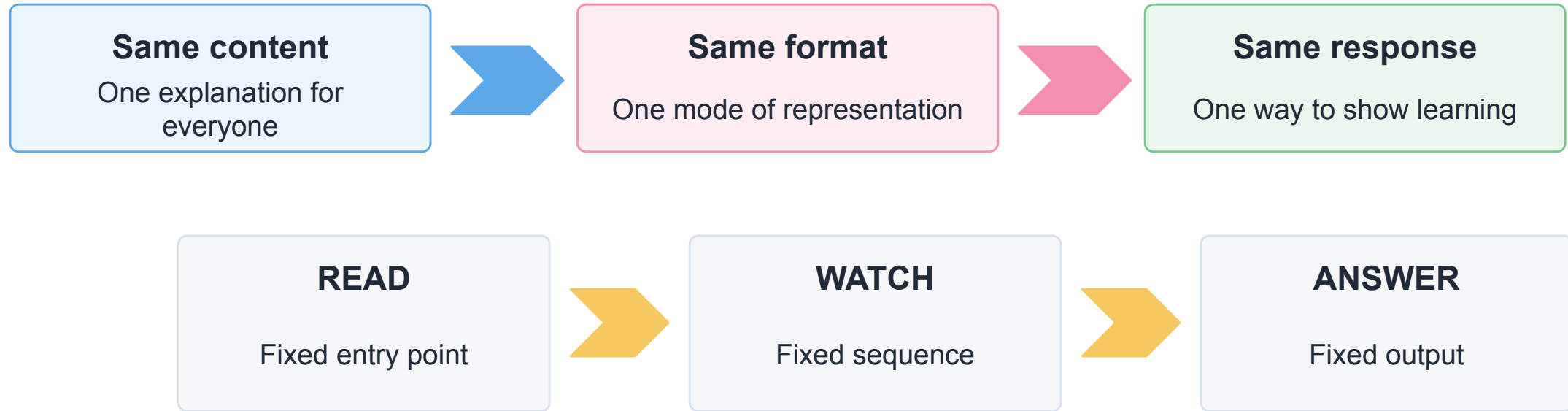
Learners vary naturally.

Variability is the rule, not the exception.

Can digital education help in this case?

A useful question — but technology alone is not the answer.

Why One-Size-Fits-All Digital Learning Fails



Digital does not automatically mean flexible.

When One Digital Lesson Creates Many Barriers

Too much text

Cognitive load

Too fast

Pace barrier

Language barrier

Comprehension

Only one way to respond

Expression barrier

Low bandwidth

Access barrier

Too many buttons

Navigation

Too much information

Overload

Not engaging

Participation

The barrier is often in the design, not in the learner.

Look at the Learning Environment

What we observe

Needs more time

Finds the language difficult

Loses attention

Finds it hard to respond

Has difficulty accessing the lesson



What we examine in the design

Is the pace too fast?

Is the language too complex?

Are there too many distractions?

Is there only one response format?

Does the design assume strong connectivity or device access?

UDL asks us to examine the interaction between the learner and the learning environment.

Design for Variability from the Beginning

Reactive design

- Design one pathway
- Wait for difficulty to appear
- Add support afterwards
- Same format for everyone
- Same response for everyone

REACT → ANTICIPATE



UDL-informed design

- Design flexible pathways
- Anticipate likely barriers
- Build support into the lesson
- Multiple ways to access learning
- Flexible ways to demonstrate learning

Same goal. Flexible pathways.

What is Universal Design for Learning?

1. Anticipate variability

Learners bring different strengths, prior experiences, needs and preferences.

2. Reduce barriers

Examine language, pace, format, access and participation.

3. Build flexibility

Provide meaningful options for access, engagement and expression.

UDL is a framework for designing learning experiences that anticipate learner variability and provide flexible ways to access, engage with, and express learning.

Design for many learners from the beginning.

UDL is Proactive, Not Reactive

REACTIVE

Barrier appears first

- support added afterwards
 - one route is modified
- learner may need to ask for help

PROACTIVE

Likely barriers are anticipated

- flexibility is built in
 - multiple routes are planned
- options are available from the start

Design supports before learners need to ask for them.

Can Every Learner Access What I Am Presenting?

SEE

Text, visuals, contrast

HEAR

Audio, narration, captions

READ

Clear language, readable layout

NAVIGATE

Simple structure, predictable controls

INTERACT

Usable buttons, links and activities

ACCESS

Device, bandwidth, file size

Access is the first condition for participation.

What Does Accessibility Look Like in a Digital Lesson?

TEXT

Readable font • good size • short chunks • clear headings • strong contrast

IMAGES / VISUALS

Meaningful visuals • readable labels • not colour-only

AUDIO / VIDEO

Clear audio • captions • replay/pause • transcript if needed

NAVIGATION

Clear buttons • simple sequence • predictable layout

INTERACTION

Clear instructions • usable click/tap targets • manageable complexity

TECHNOLOGY ACCESS

Mobile-friendly • low bandwidth • reasonable file size • common devices

Accessibility is visible in hundreds of small design decisions.

Accessible Does Not Automatically Mean UDL

ACCESSIBILITY

Can learners access and use it?

- captions
- readable text
- clear contrast
- simple navigation
- mobile-friendly
- clear audio

UDL

Does the design provide flexible ways to learn and show learning?

- more than one way to access information
 - more than one way to engage
 - more than one way to participate
- more than one way to demonstrate learning

Accessibility opens the door. UDL considers what happens after learners enter.

The Three Principles of UDL

ENGAGEMENT

Why will learners engage?

Interest • choice • relevance •
motivation • persistence

REPRESENTATION

How will learners access and
understand information?

Text • audio • visuals • examples •
demonstrations

ACTION & EXPRESSION

How will learners participate and
show what they know?

Write • speak • create •
demonstrate • interact

Same learning goal. Flexible ways to engage, understand and respond.

Engagement: Multiple Ways to Participate

The “why” of learning

- Build interest
- Offer meaningful choice
- Make learning relevant
- Support motivation
- Encourage persistence
- Provide timely feedback

Technology can support engagement

Interactive questions • simulations and challenges •
collaboration • visible progress • immediate feedback

Engagement is not entertainment. It is purposeful involvement in learning.

Representation: Multiple Ways to Access and Understand

The “what” of learning

Text

Audio

Visuals

Diagrams

Demonstrations

Animations / simulations

Examples and models

Language support

Technology can help learners

Replay or pause • zoom or enlarge • hear text read aloud • view captions • clarify vocabulary • manipulate models

Design principle

Multiple representations should clarify the concept — not duplicate information unnecessarily.

Present information in different ways so learners can access and understand it.

Action & Expression: Multiple Ways to Show Learning

The “how” of learning

Write

Speak

Draw

Create

Demonstrate

Record

Present

Interact / manipulate

Technology can support

Typed or handwritten responses • audio/video responses • digital drawings • presentations • interactive models • portfolios

Important condition

The response format should match the learning goal. Flexibility should not change the standard of learning.

Vary the mode of expression, not the standard of learning.

UDL and Differentiated Instruction

DIFFERENTIATED INSTRUCTION

Teacher adapts instruction for particular learners or groups.

- often responds after identifying needs
- may vary support, examples, pace or challenge
- different learners may receive different adjustments

UNIVERSAL DESIGN FOR LEARNING

Flexibility is built into the common learning environment from the beginning.

- anticipates learner variability
- options are available to all learners
- one inclusive design supports multiple pathways

Differentiation responds to identified differences. UDL anticipates variability.

Text Can Become Audio with Technology

TEXT ONLY

A single mode of representation
can create unnecessary barriers
for some learners.



TECHNOLOGY-ENABLED OPTIONS

Read the text
Listen to the text
Follow text while listening
Pause and replay
Adjust pace
Use captions or transcript where relevant

Same content. More ways to access it.

Static Images Can Become Interactive Models with Technology

STATIC IMAGE

Learner can view the representation.

Useful, but limited to one angle and one level of detail.



INTERACTIVE MODEL

Zoom • rotate • click hotspots • reveal labels • explore layers • compare structures • change variables • replay a process

Good interactivity makes the concept more explorable, not merely more animated.

The Design Choice Creates the Barrier

Design choice

Too many animations, text, sound and icons

Small text and poor contrast

Too many clicks or unclear pathways

No captions or transcripts

Large files / high bandwidth

Difficult vocabulary and dense instructions

Camera-on, typing-only or timed response

Possible barrier for learners

Cognitive overload and distraction

Visual difficulty and reduced access

Navigation barrier and frustration

Hearing and language barrier

Connectivity barrier and exclusion

Language barrier and reduced understanding

Participation barrier and pressure

More technology does not always mean more access.

**This can happen to the
best of us!**

Let us meet Ms Kavita ...

A case vignette about good intentions, hidden design assumptions and
UDL-informed redesign.

Ms Kavita's Original Digital Lesson

Ms Kavita is preparing a digital lesson on Photosynthesis for Class 7. She wants it to be:

Rich in content

Visually attractive

Interactive

Technologically
advanced

Engaging for students

So she adds:

- Colourful opening animation
- Detailed explanatory video
- Several diagrams
- Pop-up facts
- Links to additional resources
- Interactive quiz
- Timed final assessment

Her intention

She feels confident that she has created a high-quality digital lesson.

Good intentions do not automatically produce inclusive design.

Then the Learners Begin Using It

- Animation starts automatically and distracts some learners
- Video is long and has no captions
- Text contains difficult scientific vocabulary
- Important information is spread across several screens
- Diagrams are small on a mobile phone
- Interactive activity needs a strong internet connection
- Quiz must be completed within a fixed time
- Every learner has to type the final answer

The lesson contains several design assumptions that Ms Kavita had not initially noticed.

Ms Kavita Applies a UDL Lens

ACCESS

Can learners access and understand it?

Look at captions, language, diagrams, navigation, connectivity and device access.

ENGAGE

Can learners participate without unnecessary barriers?

Look at relevance, optionality, pace, purpose and cognitive load.

EXPRESS

Can learners show what they know appropriately?

Look at pacing, response modes and alignment with the learning goal.

UDL begins with examining the design: rethink, then redesign.

The Same Lesson, Redesigned

ACCESS

- Captioned video
- Short, clear chunks
- Glossary for difficult words
- Zoomable diagrams
- Low-bandwidth option
- Clear navigation

ENGAGE

- Optional animation
- Shorter video
- Purposeful interactive activity
- Visible progress
- Pause and revisit

EXPRESS

- Flexible pacing
- Written response
- Oral response
- Annotated diagram

The goal stays the same. The pathways become more flexible.

Five Questions Before Choosing a Digital Tool

A quick decision framework for teachers

Five Questions Before Choosing a Digital Tool

1 What is the learning goal?

2 What barrier am I trying to reduce?

3 What does the technology add?

4 Can all learners realistically use it?

5 Is there a simpler way to achieve the same learning?

GOAL → BARRIER → VALUE → ACCESS → SIMPLICITY

Choose the tool for the learning need — not the learning around the tool.

Five Things to Remember

1 Variability is normal.

2 Look for barriers in the learning environment.

3 Accessibility is the foundation.

4 Build flexibility into access, engagement and expression.

5 Use technology only when it adds meaningful learning value.

Design for variability from the beginning.