Building the world's online classroom

FOSDEM '24 Lightning Talk
Sunday, February 4, 2024
12:00 – 12:15 CET (UTC+1)
Brussels, Belgium

Frederick Dixon
ffdixon@bigbluebutton.org

Steven Muegge
smuegge@bigbluebutton.org

BigBlueButton

is a platform for purpose-built virtual classrooms

It empowers teachers to teach
and learners to learn

Video … and much more

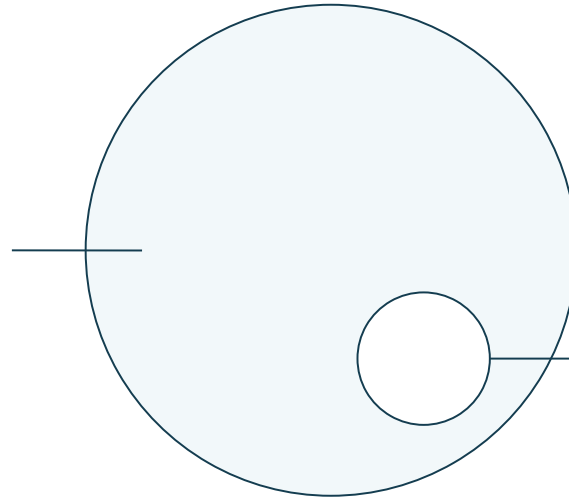**https://bigbluebutton.org**

The goal of the virtual classroom is not to meet, it is to learn

Virtual
Classroom
Platform

Goal: **To Learn**

Video
Conferencing
System

Goal: **To Meet**

United Nations SDG 4: Quality Education

"Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"

According to UNESCO (September 2023):

- 16% of children and youth are not attending school

- At primary level, 1 out of 10 children are not in school
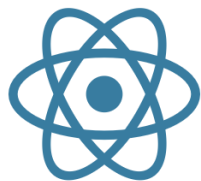
BigBlueButton is open source

- Localized into 55+ languages
- Contributions from 150+ developers worldwide
- Open source is a way to reach everyone everywhere, while respecting privacy and data protection requirements

BigBlueButton is open source

and integrates with other software systems

- Localized into 55+ languages
- Contributions from 150+ developers worldwide
- Open source is a way to reach everyone everywhere, while respecting privacy and data protection requirements

- Deep integrations with Learning Management Systems (LMS)

Built on open-source components

React

etherpad
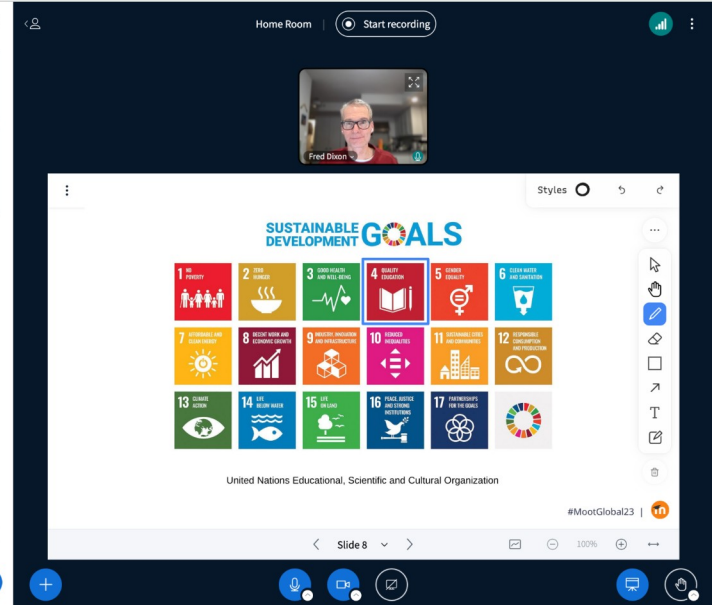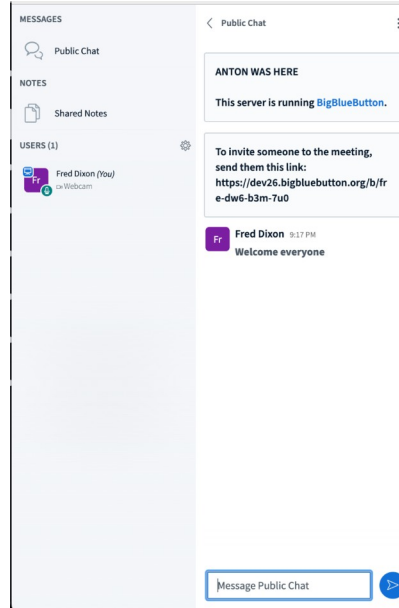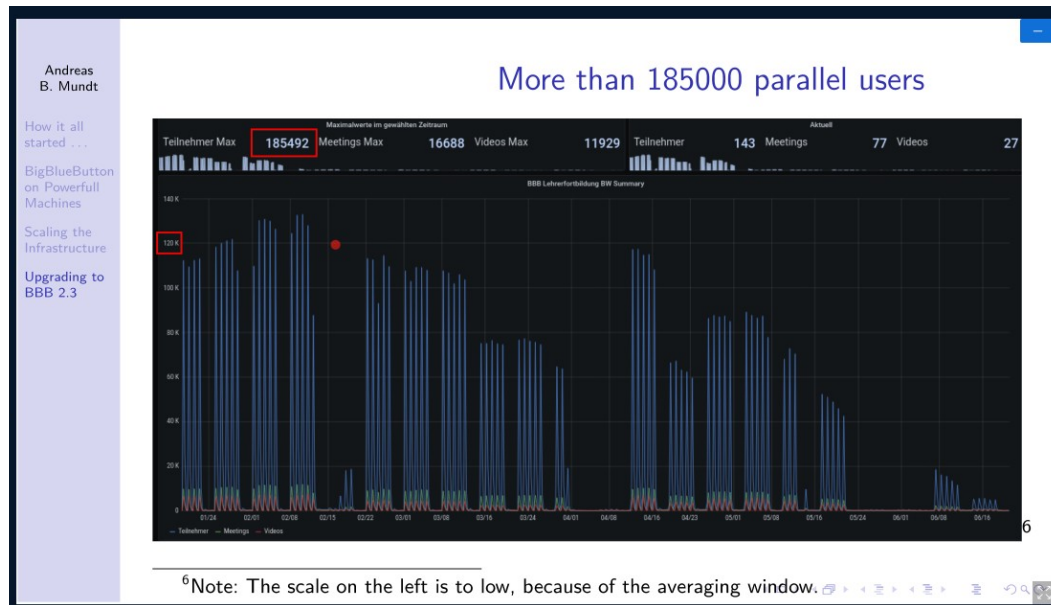

tldraw

FreeSWITCH

mediasoup

akka

METEOR

MongoDB

FFmpeg

BigBlueButton

Carleton University

2007

2024

Baden-Württemberg

Large deployments

>185,000 concurrent users at **3,000 schools**

France

Large deployments

education.gouv.fr

500,000 concurrent teachers and students

Framework $\longrightarrow$ **BigBlueButton** $\longrightarrow$ **Future**

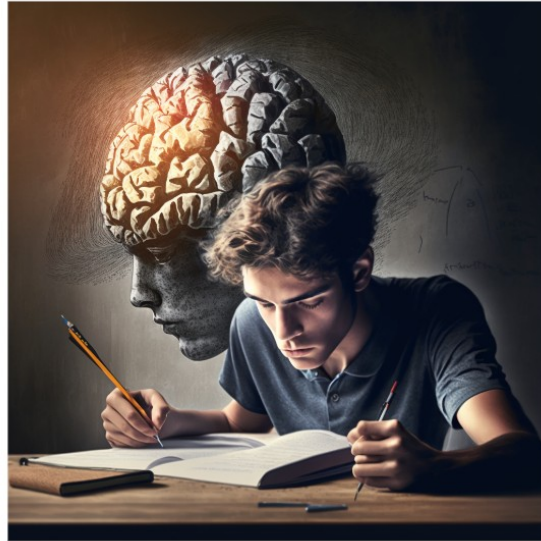**You want this response from students and teachers:**

"That was the best virtual class ever!"

65 years of Pedagogy

Framework $\longrightarrow$ **BigBlueButton** $\longrightarrow$ **Future**
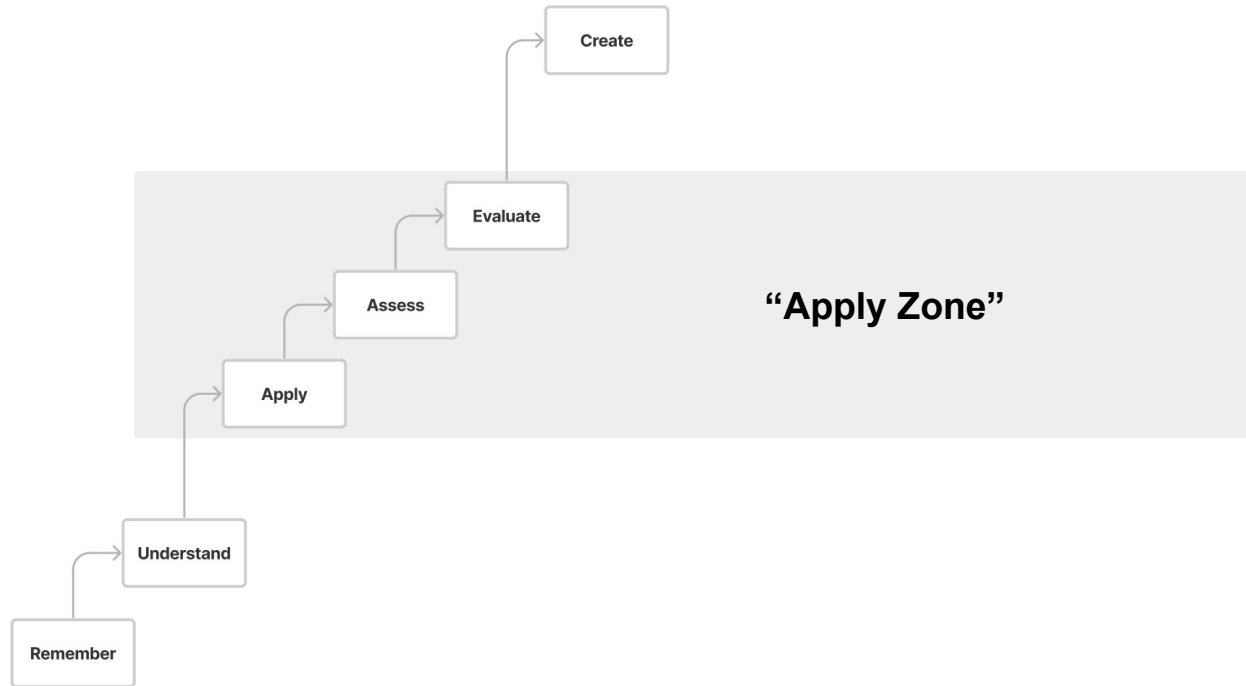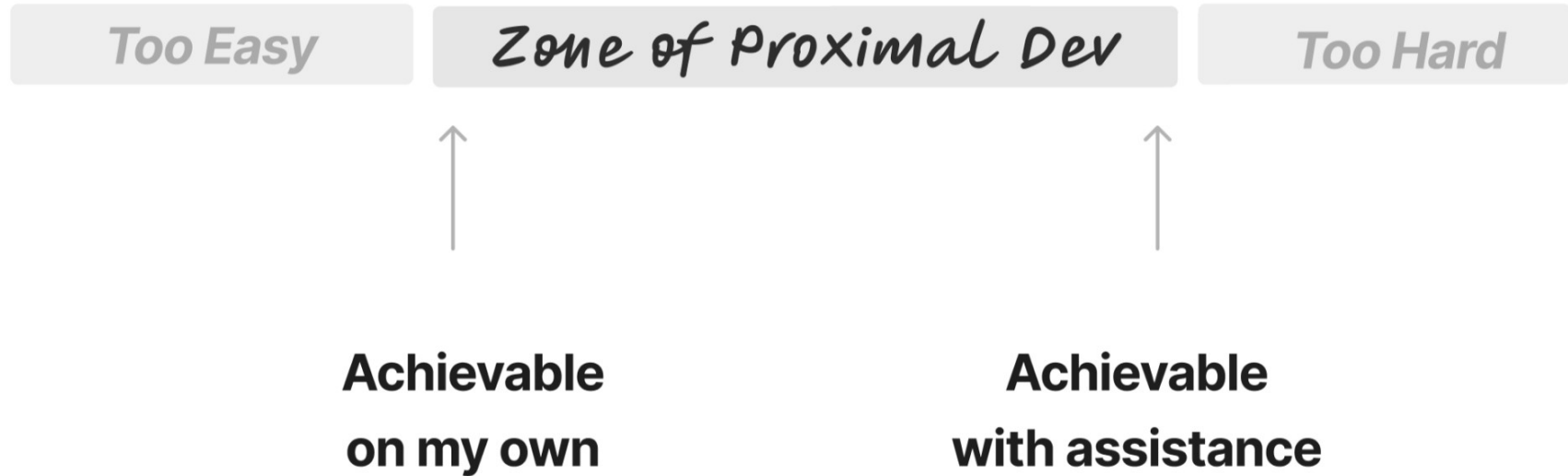
**Examples of three
ideas from pedagogy**

1: Lower-order and higher-order thinking

Version of Benjamin Bloom's *Taxonomy of Learning*

2: Proximal development; collaboration

Too Easy	Zone of Proximal Dev	Too Hard

Achievable on my own

Achievable with assistance

Version of Lev Vygotsky's *Zone of Proximal Development*

3: Social Constructivism

1. **All of us are potential teachers** as well as learners - in a true collaborative environment we are both.
2. We learn particularly well from the **act of creating or expressing something for others to see**.
3. **We learn a lot by just observing the activity of our peers**
4. **By understanding the contexts of others**, we can teach in a more transformational way (constructivism)
5. A learning environment needs to be flexible and adaptable, **so that it can quickly respond to the needs of the participants within it**.

Martin's five laws: Research-based referents that shaped Martin Dougiamas' design of the Moodle open-source learning management system (LMS)
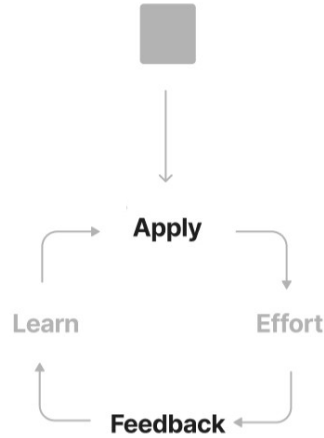Source: https://docs.moodle.org/311/en/Pedagogy

Framework $\longrightarrow$ **BigBlueButton** $\longrightarrow$ Future

Apply

Learn   Effort

Feedback

Support virtuous cycles of **applied learning**, building lower-order and higher-order thinking, with collaboration and feedback

Applied Learning ①
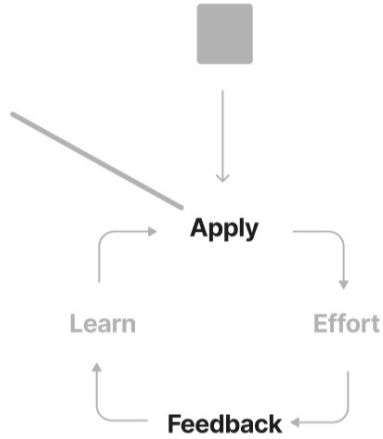
Multi-user Whiteboard

Smart Slides

Polling

Shared Notes

Reactions

Breakout Rooms

Apply

Learn   Effort

Feedback

Applied Learning ①

Multi-user Whiteboard
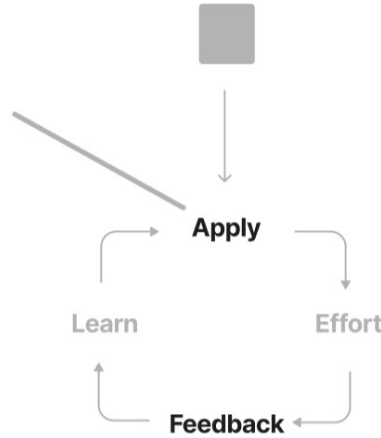Smart Slides
Polling

Apply

Shared Notes

Learn   Effort   ② **Student's Effort Generates Analytics**

Reactions

Breakout Rooms

Feedback

Applied Learning ①

Multi-user Whiteboard
Smart Slides
Polling

Apply

Shared Notes
Reactions
Breakout Rooms

Learn   **Effort**

Feedback

② **Student's Effort Generates Analytics**

③ **Learning Analytics Dashboard**

*Q: Who is struggling
that I can help?*

Breakout Rooms for Applied Learning

Breakout Rooms   Close   Create

Complete the steps below to create breakout rooms in your session. To add participants to a room, simply drag their name to the desired room.

☐ Allow users to choose rooms

Number of rooms   Duration (minutes)   ☑ Save whiteboard
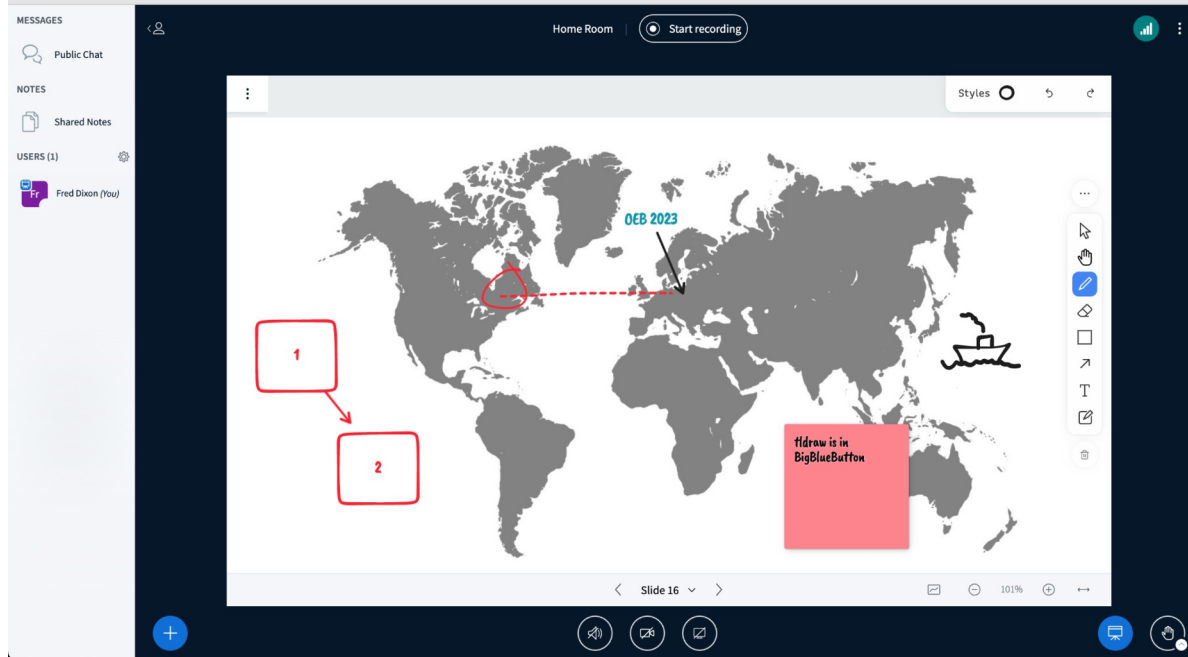   ☑ Save shared notes
2   15   ☐ Send invitation to assigned moderators

Manage Rooms   Randomly assign

Not assigned (1)	Room 1	Room 2
Frederick Dixon *(You)*		

Multi-user Whiteboard for Applied Learning

Smart Slides for Applied Learning

One click polling from content in your slides

Learning Analytics Dashboard

Home Room

0	4	17	5
Active Users	Activity Score	Timeline	Polls

Polls

USER	TOTAL ↓	WHAT DOES CONSIDERING ID...	DID EINSTEIN DISCOVER THE ...	POLL 3	HOW ARE YOU FEELING NOW?
Shankar Narayanan	5	Listen to others	**False**	**D. Apple**	**D. Very confident**
Adam Noonan	5	Listening	**False**	C. Watermelon	**D. Very confident**
Julie	5	I would put myself in their sh...	True	A. Orange	**D. Very confident**
Emily Murphy	5	Asking questions	True	**D. Apple**	C. Confident
Jacob Rosch	4	I would look at them while th...		**D. Apple**	C. Confident
Lucy	4	Listening to others ideas		A. Orange	C. Confident
Sam	3			**D. Apple**	B. A little confident

Framework $\longrightarrow$ **BigBlueButton** $\longrightarrow$ **Future**
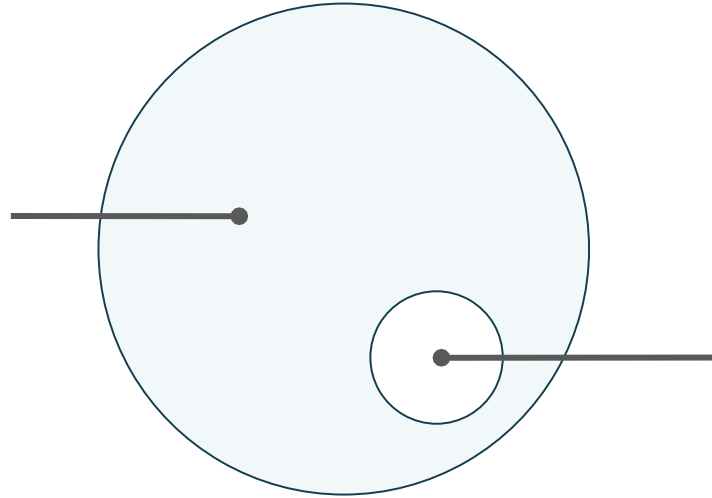
Strategy for the future

Make ourselves **awesome** for teaching and learning

Make ourselves equal (or better!)

Continued focus on applied pedagogy

- Maximize time for **applied learning** and feedback
- In applied learning, the teacher is a **coach** and **mentor**
- Build **critical thinking skills** (not just about passing exams)
- Emphasis on **teamwork** to solve harder problems
- Generate and act on analytics
- Support many virtual classroom use cases with **plugins**: fully-virtual classes, hybrid classes, meetups, workshops ...

Plugin architecture: BigBlueButton as a platform

| 2.7 | 3.0 | 3.1 |
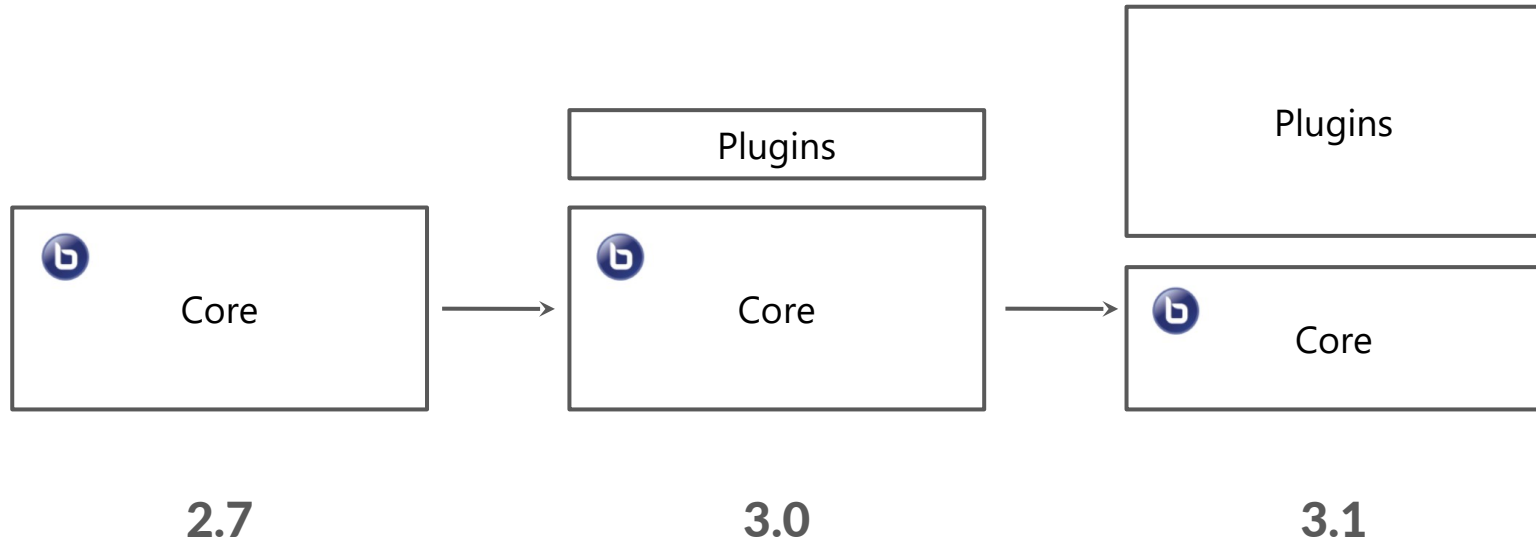
Enable AI everywhere: before, during, and after class

LMS

Relationships

Review/Preview

Summary/Next Steps
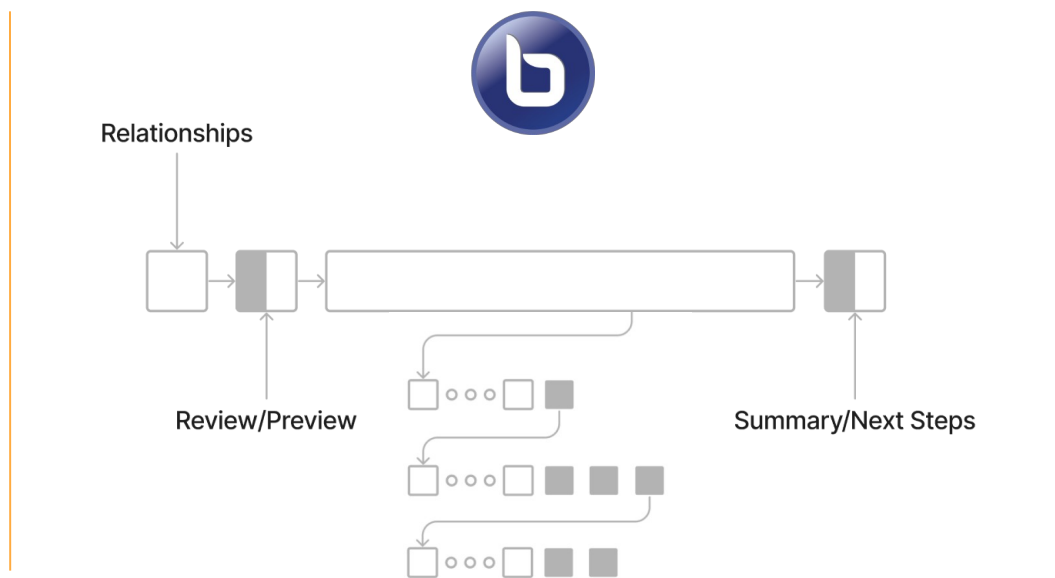
LMS

Before

During

After

What now? Join us! Get involved!

1. Use BigBlueButton
   - https://docs.bigbluebutton.org/administration/install/

2. Learn more about BigBlueButton
   - Dev list: https://groups.google.com/g/bigbluebutton-dev
   - Attend a community call (announced on the dev list)

3. Contribute to BigBlueButton
   - https://docs.bigbluebutton.org/support/faq/#contributing-to-bigbluebutton