Building the world’s online classroom

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

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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.
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
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- Deep integrations with Learning Management Systems (LMS)
Built on open-source components

- React
- etherpad
- FreeBSD
- mediasoup
- akka
- METEOR
- MongoDB
- FFmpeg
BigBlueButton

Carleton University

2007

2024
Baden-Württemberg

>185,000 concurrent users at 3,000 schools

Note: The scale on the left is low, because of the averaging window.
Large deployments

500,000 concurrent teachers and students
Framework → BigBlueButton → Future
You want this response from students and teachers:

“That was the best virtual class ever!”
65 years of Pedagogy
Examples of three ideas from pedagogy
1: Lower-order and higher-order thinking

“Apply Zone”

Version of Benjamin Bloom’s Taxonomy of Learning
2: Proximal development; collaboration

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 → BigBlueButton → Future
Support virtuous cycles of **applied learning**, building lower-order and higher-order thinking, with collaboration and feedback.
Applied Learning

- Multi-user Whiteboard
- Smart Slides
- Polling
- Shared Notes
- Reactions
- Breakout Rooms

1. Apply
   - Learn
   - Effort
   - Feedback
Applied Learning

Multi-user Whiteboard
Smart Slides
Polling
Shared Notes
Reactions
Breakout Rooms

1

Apply

Learn
Effort
Feedback

2

Student’s Effort Generates Analytics
Applied Learning

1. Multi-user Whiteboard
   Smart Slides
   Polling

2. Learn
   Effort

3. Feedback

Student’s Effort Generates Analytics

Q: Who is struggling that I can help?

Learning Analytics Dashboard
Breakout Rooms for Applied Learning

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.

Number of rooms: 2
Duration (minutes): 15

- Allow users to choose rooms
- Save whiteboard
- Save shared notes
- Send invitation to assigned moderators

Manage Rooms

<table>
<thead>
<tr>
<th>Not assigned (1)</th>
<th>Room 1</th>
<th>Room 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frederick Dixon (You)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Multi-user Whiteboard for Applied Learning
Smart Slides for Applied Learning

One click polling from content in your slides
<table>
<thead>
<tr>
<th>USER</th>
<th>TOTAL</th>
<th>WHAT DOES CONSIDERING ID...</th>
<th>DID EINSTEIN DISCOVER THE...</th>
<th>POLL 3</th>
<th>HOW ARE YOU FEELING NOW?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shankar Narayanan</td>
<td>5</td>
<td>Listen to others</td>
<td>False</td>
<td>D. Apple</td>
<td>D. Very confident</td>
</tr>
<tr>
<td>Adam Noonan</td>
<td>5</td>
<td>Listening</td>
<td>False</td>
<td>C. Watermelon</td>
<td>D. Very confident</td>
</tr>
<tr>
<td>Julie</td>
<td>5</td>
<td>I would put myself in their sh...</td>
<td>True</td>
<td>A. Orange</td>
<td>D. Very confident</td>
</tr>
<tr>
<td>Emily Murphy</td>
<td>5</td>
<td>Asking questions</td>
<td>True</td>
<td>D. Apple</td>
<td>C. Confident</td>
</tr>
<tr>
<td>Jacob Rosch</td>
<td>4</td>
<td>I would look at them while th...</td>
<td>True</td>
<td>D. Apple</td>
<td>C. Confident</td>
</tr>
<tr>
<td>Lucy</td>
<td>4</td>
<td>Listening to others ideas</td>
<td></td>
<td>A. Orange</td>
<td>C. Confident</td>
</tr>
<tr>
<td>Sam</td>
<td>3</td>
<td></td>
<td></td>
<td>D. Apple</td>
<td>B. A little confident</td>
</tr>
</tbody>
</table>
Framework → BigBlueButton → 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
Enable AI everywhere: before, during, and after class
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