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Hybrid Classroom:
A Framework for Reopening Schools during COVID - 19

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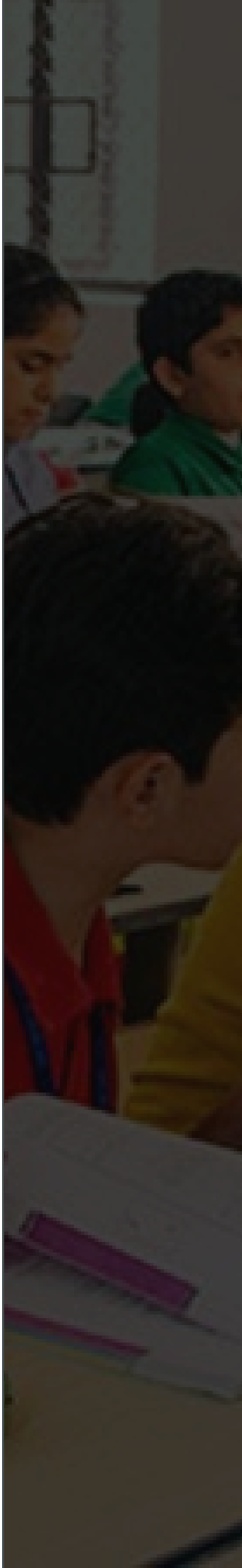


Check out the strategies in sync with

Government Mandate

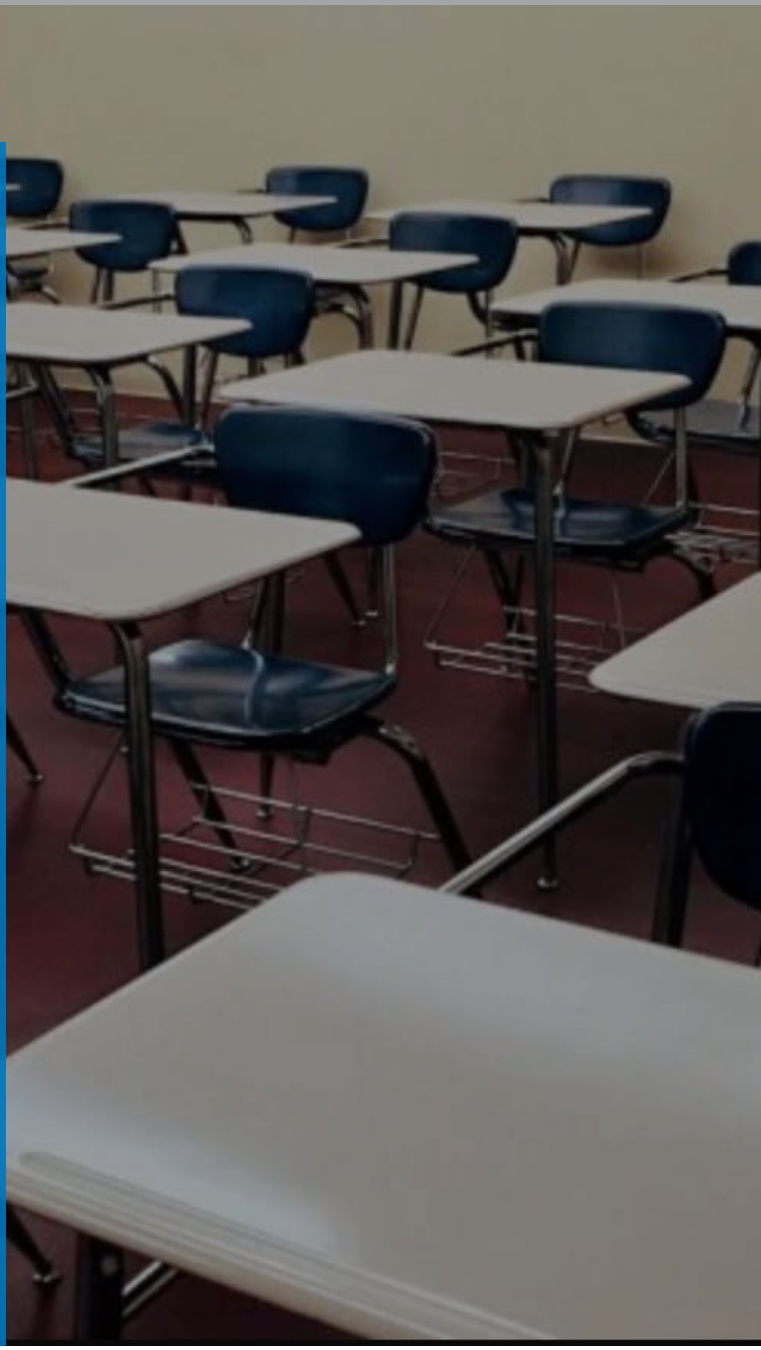
Abstract

With an aim to strike a delicate balance between reopening of schools and colleges while averting a potentially devastating wave of infections of COVID -19, the Government and Educational Leaders across the globe are formulating new rules and safety guidelines for the students to attend physical classroom in a day, new seating matrix, staggered classes, a shift system, new rules for mess and library, and sanitised premises.

To progressively lift the restrictions, decision makers of educational institutions are continually assessing how learning and well-being of each stakeholder can be best supported in each context, including partial, progressive, and full reopening of schools, coupled with classroom-based instruction and remote learning solution. The sole target is to continue the classes for students – even when they are attending the classes in a physical classroom twice a week.

We have evaluated and analysed the benefits of classroom instructions necessary to maintain human connections and develop foundational skills that got interrupted due to school closures. Yet again, when we are talking about unveiling strategies to lift lockdown restrictions while following Government's mandates to reopen the schools with social distancing and maintaining 30% attendance in a day, what could be the best way?

Adopting hybrid classroom instruction method to deliver engaging classes through face-to-face and virtual, simultaneously.



Introduction

Every school, college, and university around the world has been closed as one of the measures to contain the COVID-19 outbreak. The learning journey of students was halted and became uncertain. Educational institutions and educators were struggling to identify better ways to connect with students and resume learning. Keeping the students' interest as the top priority, Government and the leaders of Educational Institutions are working out on different strategies for the safe reopening. This framework serves to assist in the decision-making process on how to re-open schools.

5 POINT APPROACH

1. Face to Face Teaching
2. Online Teaching
3. Self Learning
4. Formative Assessment
5. Instant Feedback & Guidance

Why is it Important to Reopen Schools?

Every student comes from different backgrounds and so is their learning needs, the requirements of resources, opportunities, and support they get outside the school premises. Now, when they are relying solely outside the school for every learning need, those differences can be clearly seen. This crisis has not affected some of the students as they have high-quality learning opportunities, access to online classes, hi-tech devices, and good internet connection. Conversely, for many students, they don't have access to anything of quality and are at a great disadvantage. Clearly stated, those who are the most economically challenged are the most vulnerable while those who are in good positions are not losing much.

In many countries where compulsory education for child itself is a big challenge, keeping them out of school will increase the chances of discontinuing education. This could take us back by a decade.

Arguably, this is something every educational institution should have implemented a long ago, making sure each student has a device and good connection to remain connected even when they are out of the school. Twenty-first century learning absolutely requires technology enabled devices and good connectivity. We can't leave this to chance or the accident of birth.

Main Challenges in Re-opening Schools?

1. Who gets to determine the acceptable risk of COVID - 19, should we return to in-person instruction?
2. What will be the COVID-19 testing protocols for students, staff, visitors, etc.?
3. Will there be modifications – school timings, half-day, shift system, class size restrictions, one-day on one-day off, how many classes to complete one topic for all students?
4. Do schools have the infrastructure to maintain social distancing?
5. If younger kids can wear masks and gloves all day?
6. What protocols will be required for extra-curricular activities like sports and music? How frequently equipment needs to be sterilized?
7. What will the cafeteria look like? How many students will be allowed at a time? And how many hours of break will be in total?
8. How students and teachers from the containment zone would attend the classes?
9. Will there be any leniency in assessments during this session? How will schools assess, grade, and provide feedback to students and parents during an extended closure?
10. How teachers would teach topics / subjects that require hands-on interactions in close proximity, such as robotics, lab works etc.?

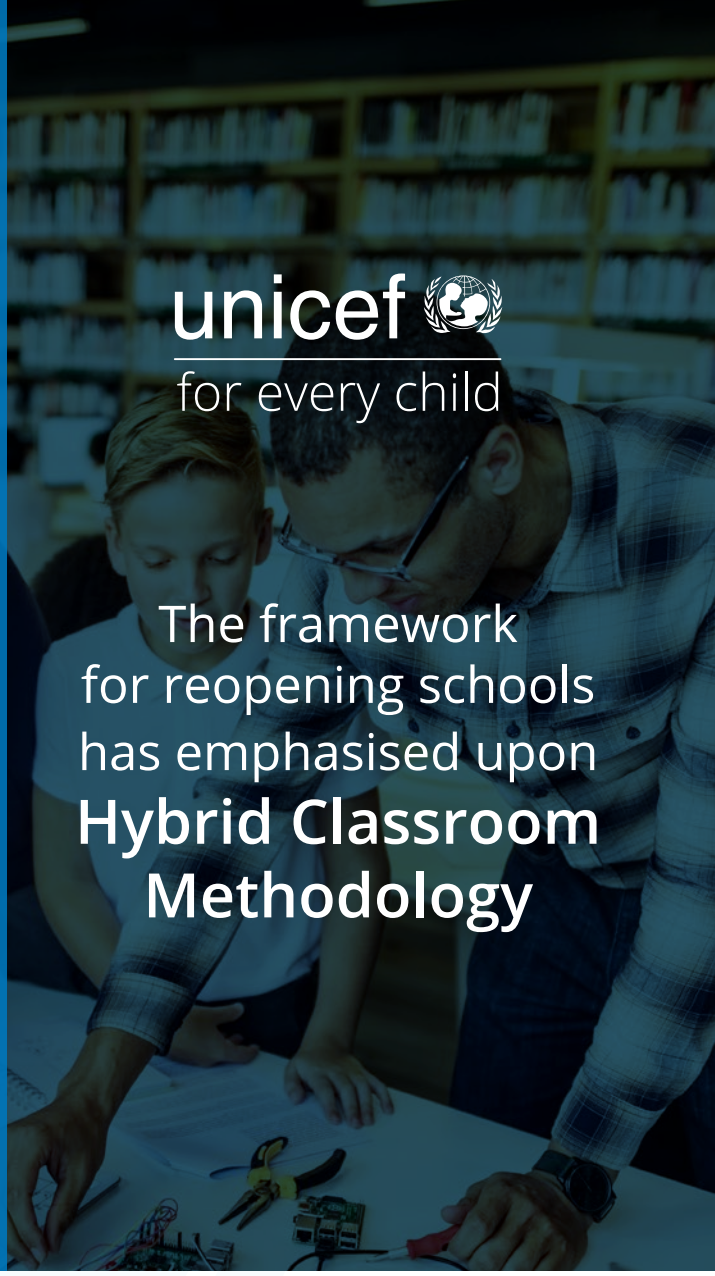
In response to the COVID - 19 pandemic and global school closures, the United Nations Secretary-General Antonio Guterres recently called on governments and donors to prioritize education for all children, and asked decision-makers to assess how learning and wellbeing can best be supported in each context - classroom-based instruction and remote learning.

UNICEF has released a framework for reopening schools and has mandated:

a. To prepare for future rounds of school closing.

b. To strengthen teaching and learning where closures remain in effect.

c. To supplement instructional hours with a hybrid classroom model where schools may be operating on partial or otherwise adapted schedules.



Returning to Campus in a Strategic Way

Maintaining less students in the school is important to maintain safe school operations and mitigate risks through social distancing, sanitizing the premises, maintaining hygiene facilities etc.

Authorities are considering reopening schools in rotational shifts, staged approach, and shift system.

What does this mean?

Rotational shifts means 30% of the students and staff would be allowed in the physical classroom while rest would be attending the same classes via remote teaching.

Staged approach involves returning of students and staff to the campus in a smaller group, like 30%, 50% and if things go well, 100%.

Shift system is about attending the classes in a schedule, like 7AM - 12PM and 1PM - 6PM.

Are Schools Ready to Resume on a Rotational Shift Basis?

Let's see how prepared the schools are to reopen.

- How teachers will connect with the students who are at home?
- Are the tools to teach from home simple and easy to learn?
- What would be the process of assessment and grading?
- How students will cope up with one day school and one day home learning? Will they be on the same page when they go back to school with a gap of a day or two in between? How this continuity will be managed?
- Is there any tool to measure the students' attentiveness during classroom and remote learning?
- What if, a student fails to attend class due to illness or other reasons? What strategies have been made to manage it?
- How teachers are planning to cover their lessons?

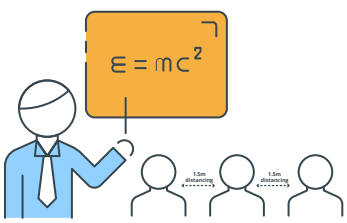
What is required?

1 Change in Instructional Model

To adopt a method that integrates online and traditional face-to-face class activities simultaneously, wherein offline and online modes capitalize on each other's strengths. With fewer in-seat session, hybrid classroom brings students and instructors together, with the flexibility of place.

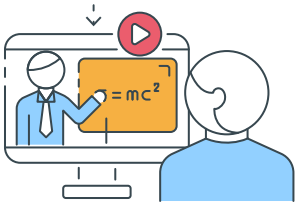
Hybrid classroom facilitates a certain per cent of students to learn face-to-face in a classroom, while those who are not at campus maintaining social distancing can attend the class from the comfort of their home virtually.

Hybrid Classroom Model



F2F Instruction

30% students attend Face to Face Instruction in classroom



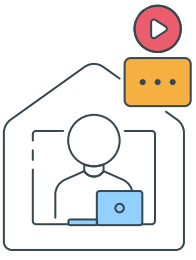
Online Instruction

70% students attend the same class through remote learning.

Self Learning Model

a. Students access the recorded classroom sessions shared by teacher

b. Students access the recorded topics shared by teachers



Online Self Learning

Self-learning with the digital lessons and recorded lectures shared by the teacher

2 Teaching and Learning Devices

To enable a hybrid classroom approach, students and teachers are required to have a device which can be a laptop, PC, tablet or mobile to perform their tasks. For the instruction in classroom, smart devices like IWB, IFP are preferred.

Teacher's Approach

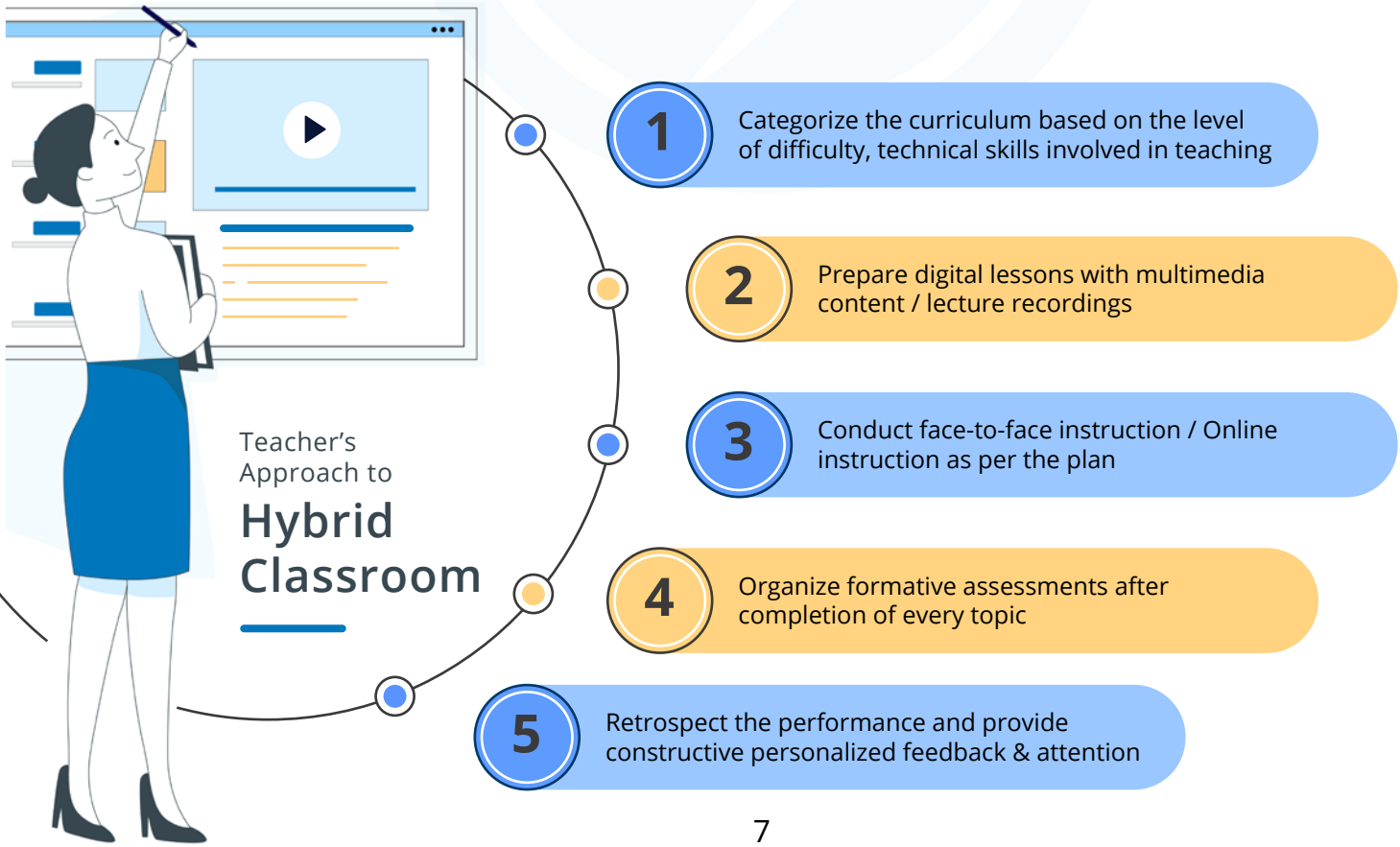
- The foremost requirement is to design a curriculum based on the level of difficulty and technical skills involved in teaching. Chemistry concepts can be taught online, but titration of acids need presence in the lab.

- Now, when you cannot determine the attentiveness of students or if they understood the concept just from a look, you have to be extra careful while crafting the lessons, adding all the interesting content, video, and images. The multimedia-rich lessons are much easier to understand and memorise.

- Divide the students in batches for face-to-face and online learning.

- After completion of every topic, formative assessment can be done, wherein AI will share the workload of creating the questions, preparing the answers and grading the sheets. Not only this, the obtained marks / grade would be also updated in the knowledge graph of each student.

- Formative assessment would show the gaps in each topic, which can be patched up with offering personalized content recommendation to each student, based on their learning curve.



Student's Approach

- Learn at your own pace with the shared resources. Students can access the resources shared by the teachers and they can access it as many times as they want, inculcating self-learning ability.

- Even after the end of this crisis, students will have the flexibility to attend the class from the campus or home.

- Hybrid classroom would give power to students to remain connected with their teachers and classmates virtually. They can collaborate on lessons, projects, and activities shared by the teacher.

- Students will get an immediate feedback, instant grading, and personalized content recommendation, based on their skills. This will surely help them in patching up their weaker areas and encourage them in maintaining the strong grip over their favourite subjects.

Real-time collaboration on lessons, projects, activities with teachers and fellow students

Self-learning ability with the access to lessons any time enabling learning at own pace

Flexibility to attend classes face-to-face or from home

Immediate feedback and guidance based on performance

Personalized recommendations to achieve their goals

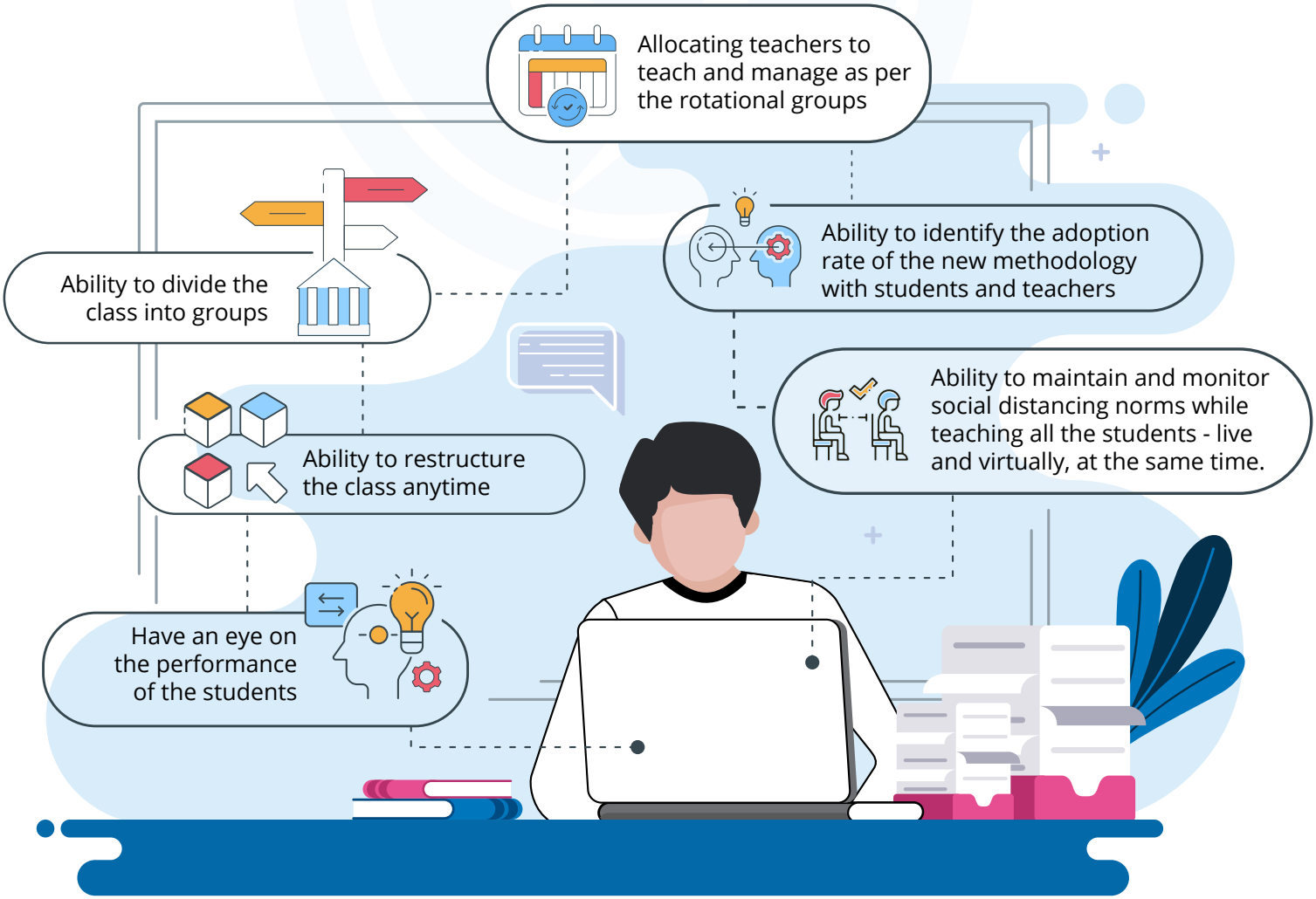
Student's Approach to Hybrid Classroom

Administrator's Approach

- Administrator should have the flexibility to divide the class into several groups. This division will become the basis of attending class at campus and home.
- Divide the students into two batches for face-to-face and remote classes. Those students who stay nearby, commute by their vehicle, and not part of containment zone could be a part of face-to-face classes. Rest could attend the same classes remotely.
- Managing staff and allocating resources to take the class in a day. Admin can allocate the classes to teachers.
- Data analytics to analyse how quickly students and staff have adopted hybrid classroom approach, students' performance, attendance, device utilization anytime.
- Even without personal meeting with the stakeholders, admin should have the advantage to keep himself updated about all the activities.
- Communication system to keep every stakeholder informed.

Administrator's Approach to

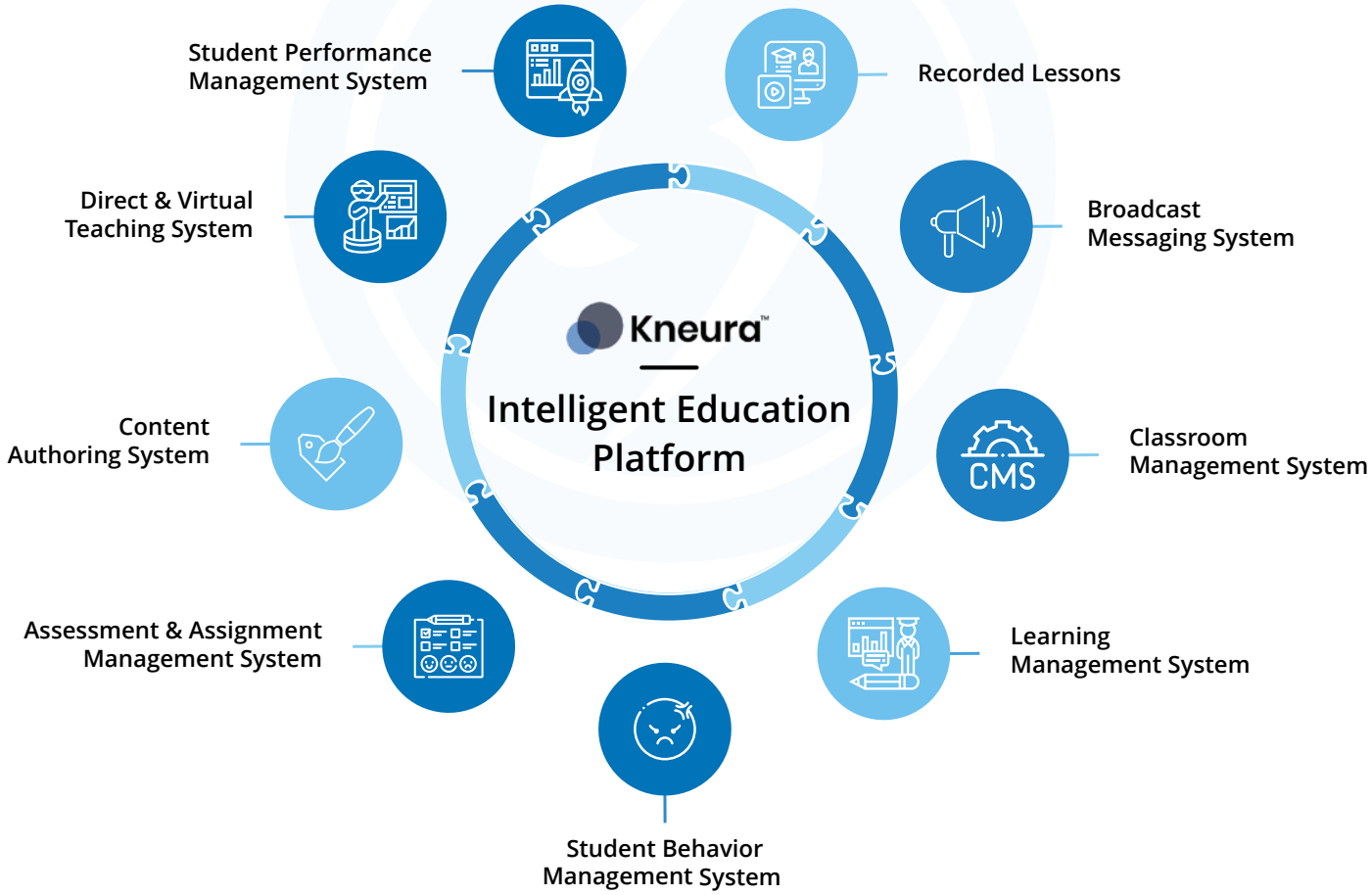
Hybrid Classroom



How to achieve this?

To implement a Hybrid Classroom enabling Blended Learning, traditionally we need to assemble almost a dozen different tools and make them work together.

Cybernetyx proposes one-step approach through ***Intelligent Education Platform.***



Student Performance Management System

Evaluating the overall performance of students was always a tedious task. Thanks to the most advanced technologies like AI that tracks the knowledge gain, attentiveness, interest, IQ level, content recommendation, and personal information of every student and updates the same in their digital profile.

Direct & Virtual Teaching System

Teach without any interruption, without any constraint of teach from home or teach from brick-and-mortar classroom. With blended learning, teachers can create lessons and share them with the students prior to the classes. So, if the students are coming to the class or attending live tutoring, they would have an idea about the upcoming topic.

Content Authoring System

The content authoring tool enables teachers to create stunning lessons, by pulling videos, images, and texts online. Understanding and memorizing the concepts through images and videos has proved to be easier than the class notes dictated by the teacher.

Assessment & Assignment Management System

Our teachers work hard conscientiously but their best efforts got thwarted in lack of an intelligent assistant that could share the workload while ensuring zero error. What could be better than technology-enabled assistant that could formulate questions, prepares answers and grades too, with zero error.

Student Behaviour Management System

Maintaining the attentiveness, response and interest of learners throughout the year and for every subject is not an easy task. In the current scenario, maintaining and monitoring the social distancing is also an important factor. Measuring the knowledge of a student in every topic and keeping a track, year-by-year would not only help student to excel but allow authorities to track the performance.

Learning Management System

The curated content helps students and teachers alike. With LMS, teachers can share the resources with the students and help them in gaining a good hold of easy as well as complex topics with great ease. No need to bother about carrying a pen drive or a bundle of sheets, login from any device, access the lessons and start teaching.

Classroom Management System

Add and manage students and teachers, map courseware, allocate classes, check attendance, and track the growth of students, right from a single login – Admin Dashboard.

Broadcast Messaging System

Streamline communication with all the stakeholders - students, teachers, administration, and parents through broadcast messaging that allows admin to send the message to all in one go. Whether it is about a holiday, celebration or meeting, just draft the message and share it with intended persons.

Recorded Lessons

Making it possible for students to watch and rewatch the video shared by their teacher is the new pedagogical method, which allows students to learn at their pace. Students can access the video without any constraint of time and place and come prepared with the doubts before the class, making it interesting, engaging, and interactive.

About Cybernetyx

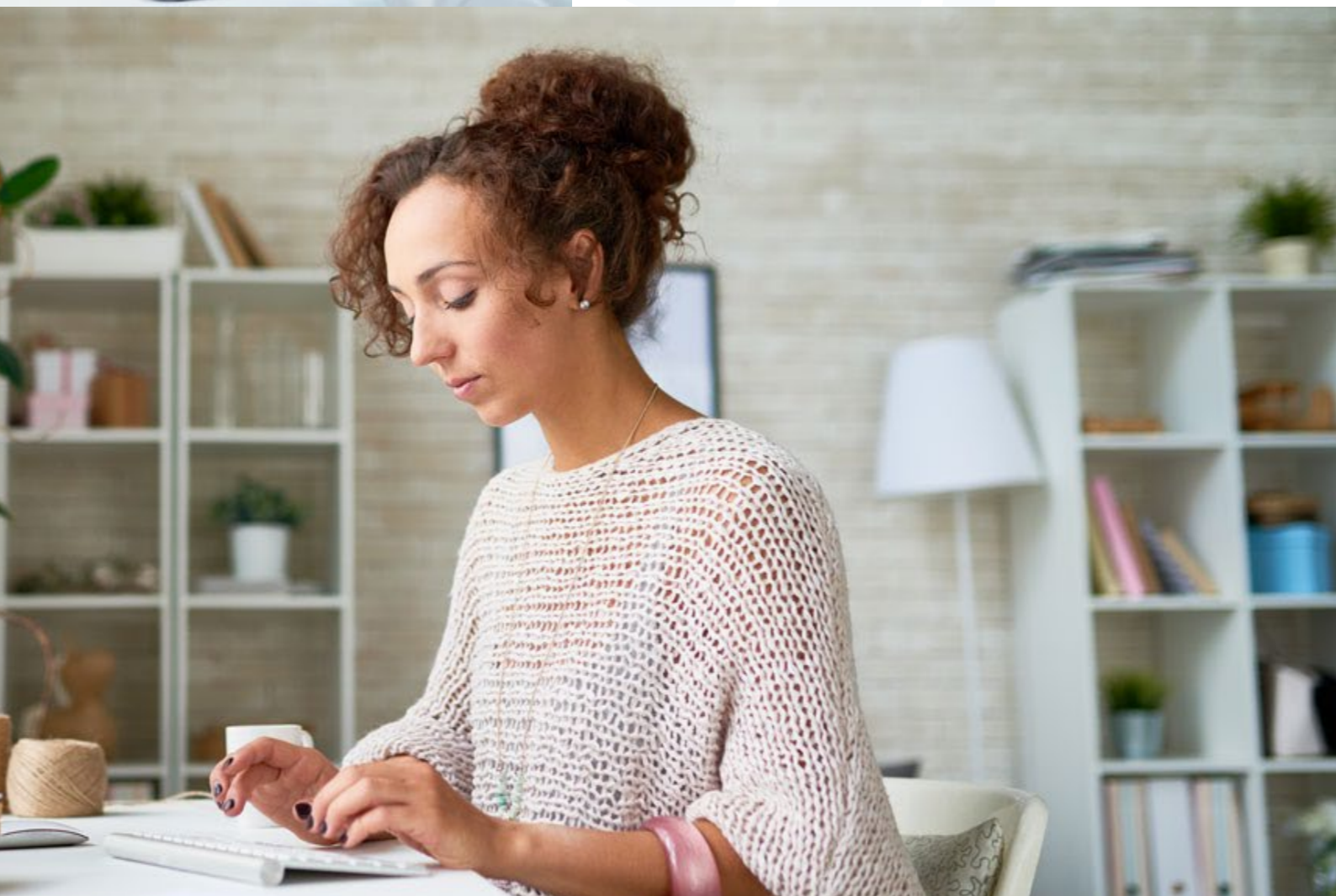
Cybernetyx® is a Global Leader in Interactive technology with a vision to make our interaction with computers and displays easier and more productive. Worldwise, Cybernetyx's flagship technology EyeRIS is licensed and used in millions of devices by Display giants such as NEC, ViewSonic and SONY.

As on 2019, Cybernetyx ranked #1 in the no. of total Smart Classroom installations in India with over 135K installations.

In 2020, Cybernetyx launched Kneura AI Education Platform to address the challenges of educators and administrators. Being a Hybrid Classroom Platform, the need for Kneura has balooned due to the COVID-19 pandemic as it serves the right balance of physical and remote classroom teaching.

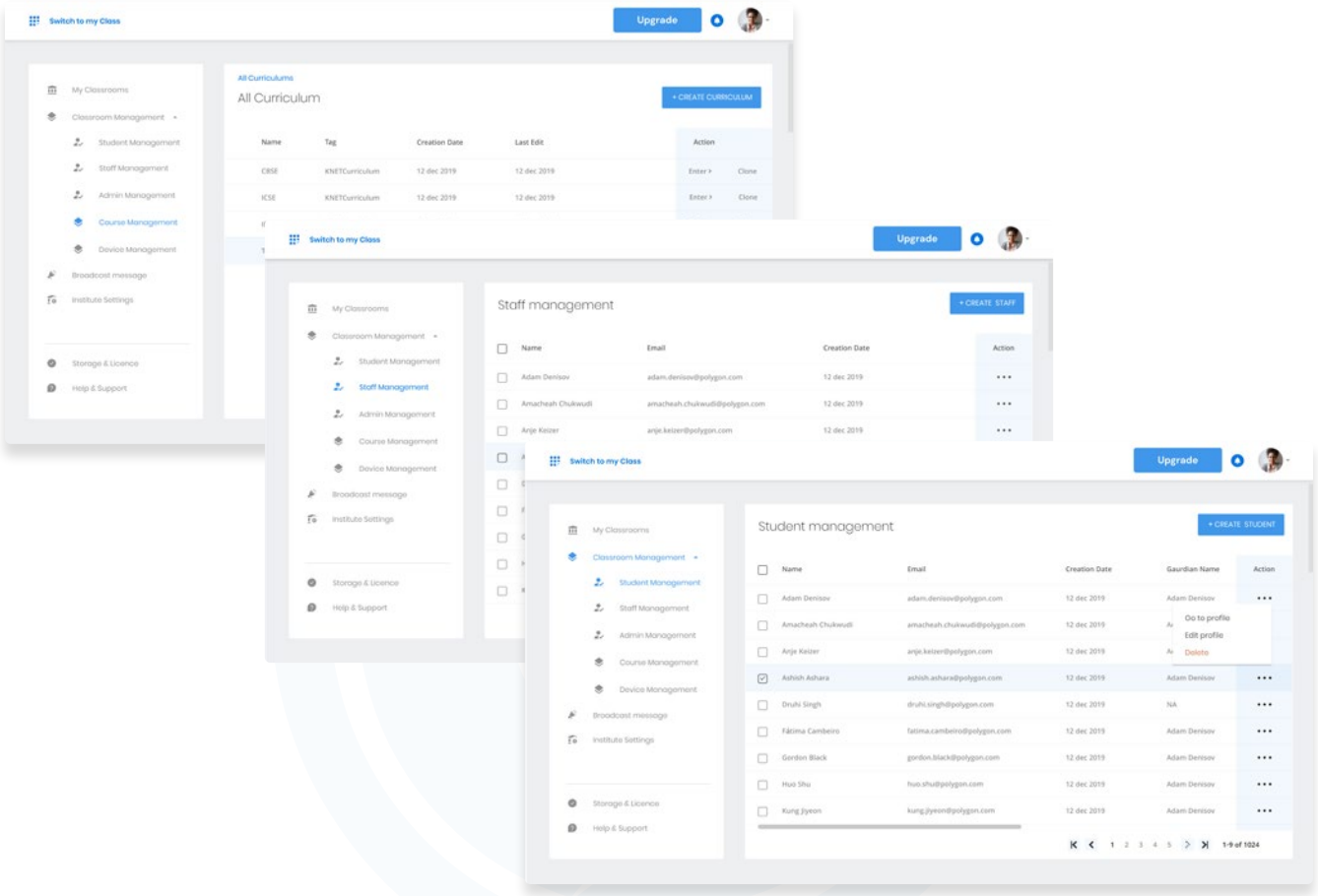
Introducing Kneura

Kneura™ is the World's first Hybrid Classroom platform with complete suite of teaching and learning features, incorporating the best of traditional face-to-face and online learning methods so that instruction occurs both in the classroom and online at the same time, and where the online component becomes simply a natural and powerful extension of traditional classroom learning. The platform delivers immediate value to any educational institution looking to leverage technology to transform any traditional classroom that is confined to a physical space to a hybrid classroom environment, where teaching and learning can happen from anywhere, anytime and on any device.

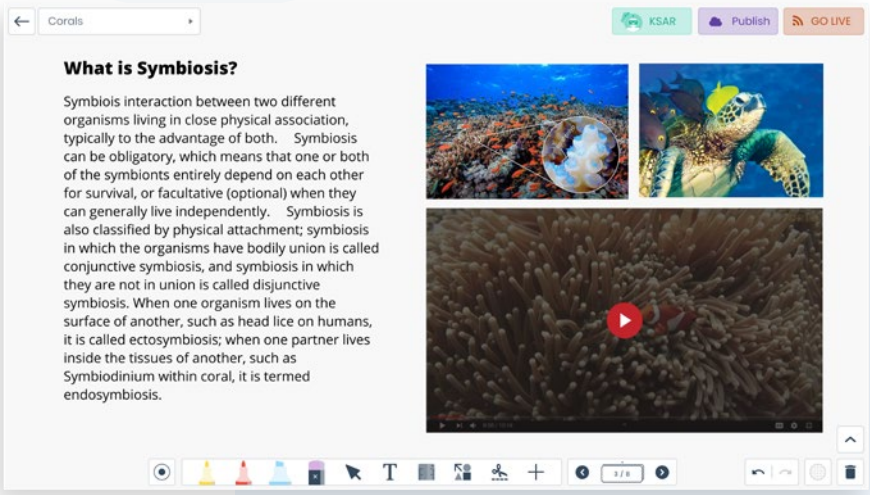


Features and Capabilities of Kneura

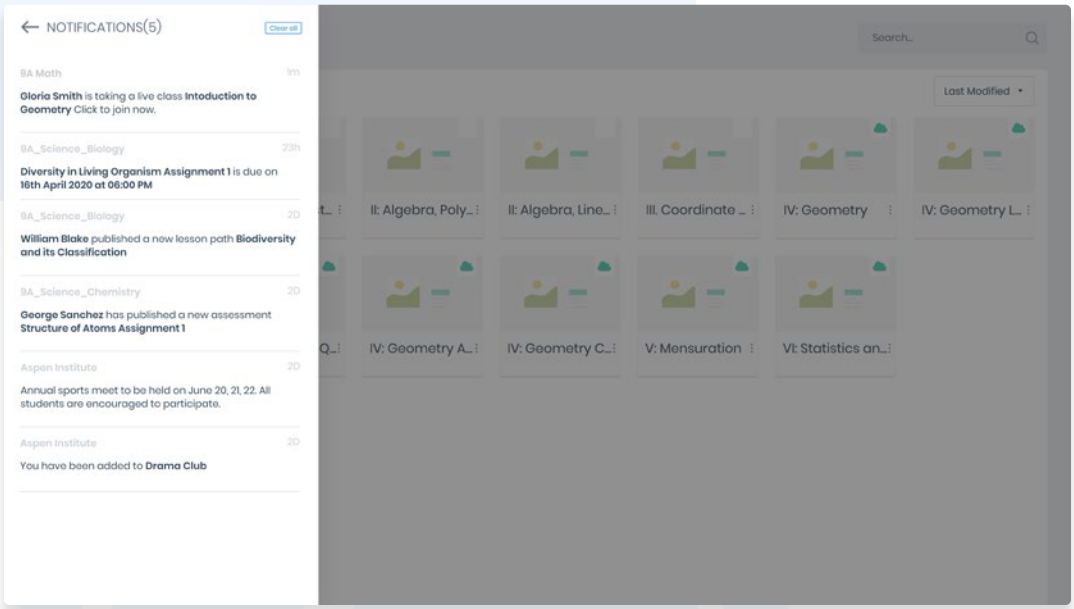
Create a virtual copy of institution, by adding teachers, students, administration, learning resources on single platform. Flexible to map students to classes or groups as per the set rotational approach. Teachers and students can access the platform with their respective logins at any time.

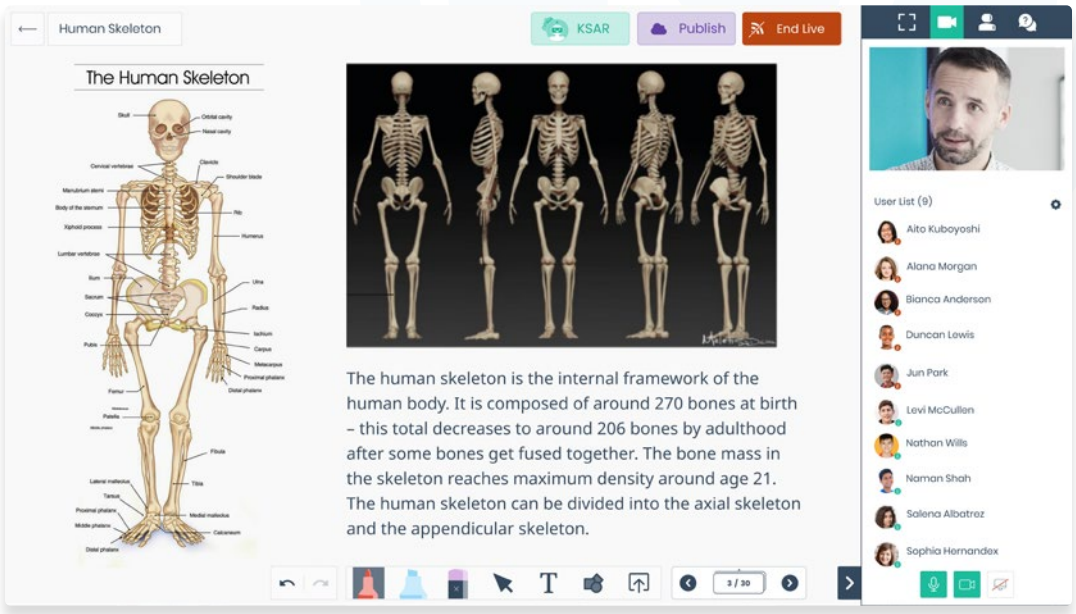


Create Beautiful Digital Lessons using the built-in content authoring tools like smart pen, multi-colour selection, highlighter, smart shapes draw, drag and drop access to web content in the form of images, text, videos based on search query or pre-defined automated and manually added curriculum.



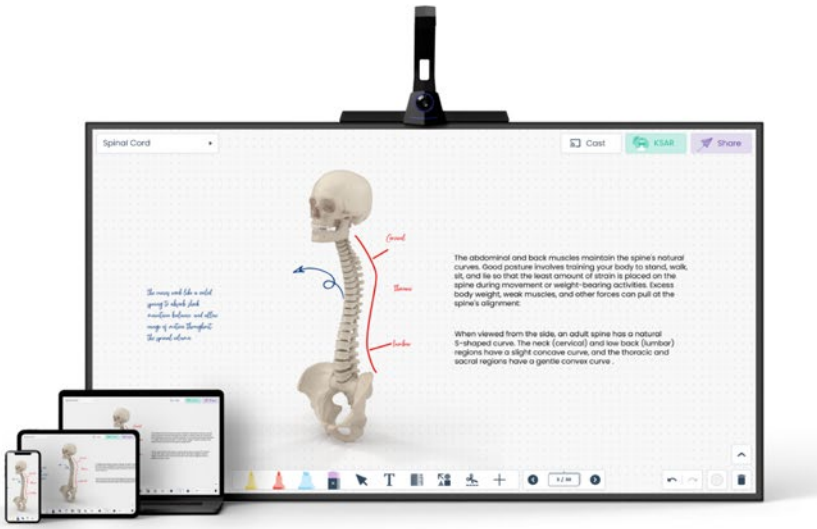
Secure storage to share and manage lessons.
Students get notification and access to view the lessons at once it is published by the teacher. Any updates or annotations on the lesson while instruction will be updated automatically. These lessons act like collaborative canvas, which will be accessed by the students in real-time.





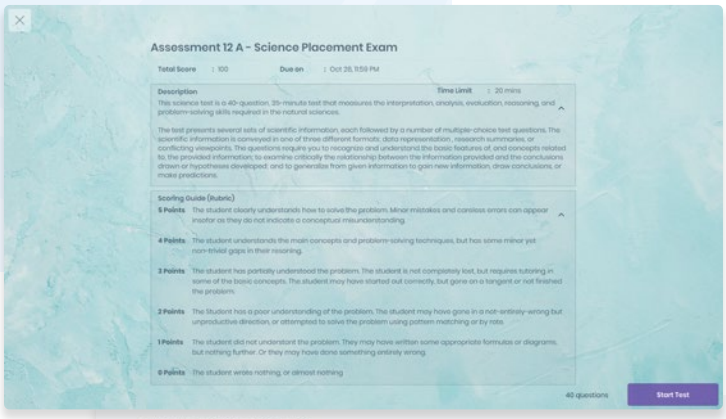
"Go Live" button inside the lessons will open a complete audio and video enabled virtual class. Authorised students in the class get notified and join the class from anywhere. The online teaching happens via secure https protocol and follows datagram transport layer security which is the highest level of security index in Video conferencing. The interactive teaching tools on the canvas creates a real-time classroom like experience virtually. Options like polls, chat, quizzes are available to increase student engagement.

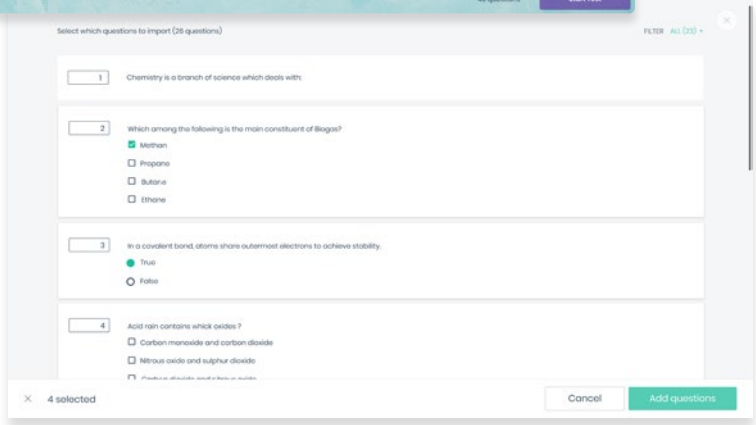
Face to face instruction in classroom is a seamless continuation of the digital lessons shared with students. Teachers can access the lesson from Kneura platform through any of the smart devices in the classroom (can be a laptop, PC, projector, Interactive Whiteboard, Interactive Flat Panel). With the wide gamut of interactive tools, teachers will be able to conduct engaging sessions.

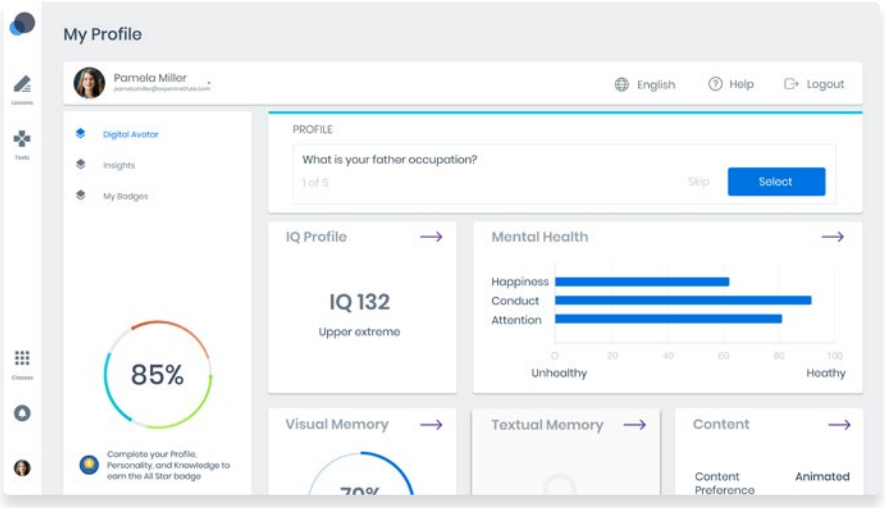


Recorded lessons give the flexibility and ensures an amazing learning outcome where students learn at their own pace, independently engage with shared resources, and develop critical-thinking skills. The recording feature enables teachers to record the entire session and share it with students to watch at their convenience.

Monitor student understanding through formative assessments after the completion of the topic. AI question generator enables quick creation of test questions by just copy pasting the lesson. Multiple templates for questions like True or false, multi select, multiple choice, image selection gives various options to the teacher to create questions. Setting the correct answer and points with respect to the questions will auto-grade and give instant results once the student attempts the test.

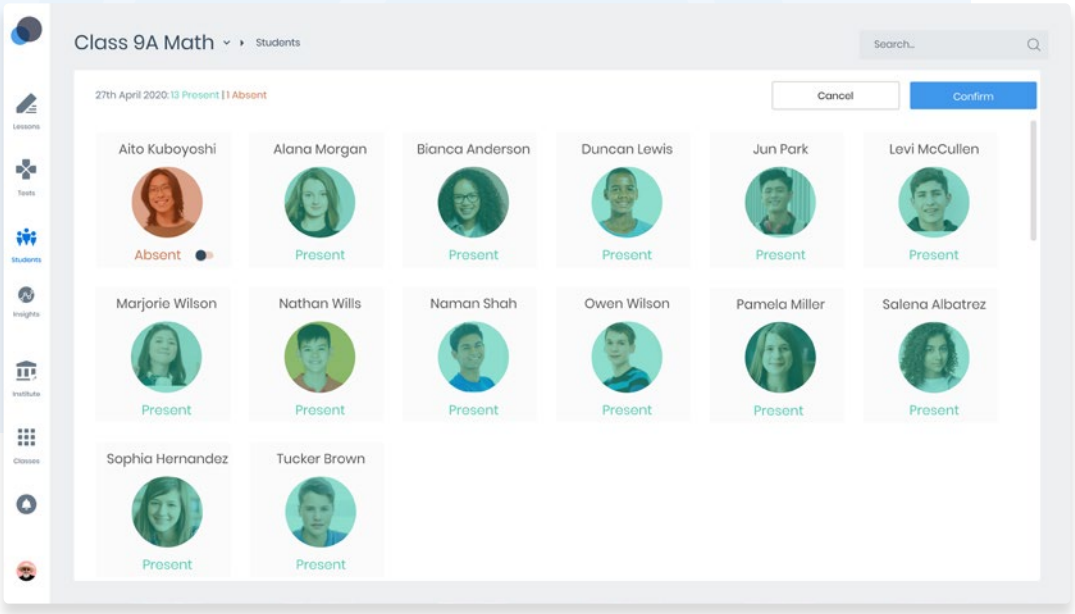


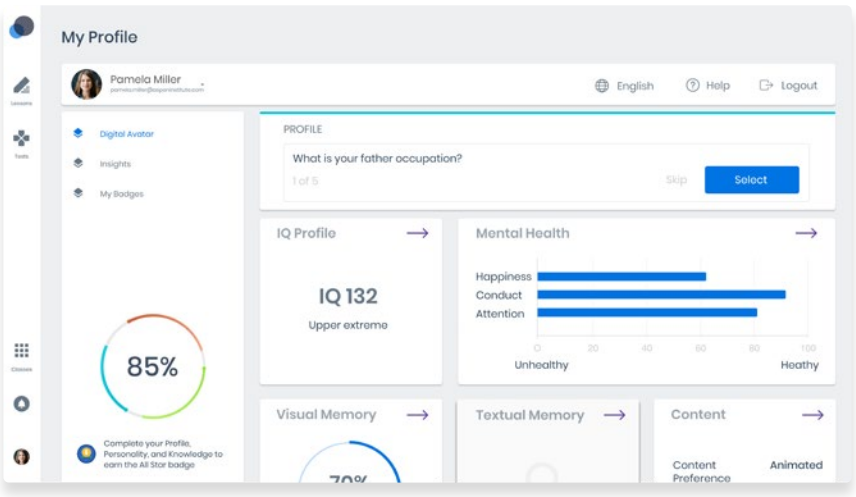




Digital profile of the student is maintained and constantly updated with the performance of the student in class and assessments. Based on the insights generated teachers provide personalized feedback and guidance required to the students.

Automated attendance, performance and utilisation reports gives more control to the administrators to know the performance of the school, the adoption rate of the new technology by teachers and students. This provides the path for retrospection and improvement.





Internal **institution wide communication or notification** on lesson / test updates can be handled from one place.

Expected Challenges for Adoption

1 How to enable Hybrid Classroom in different settings

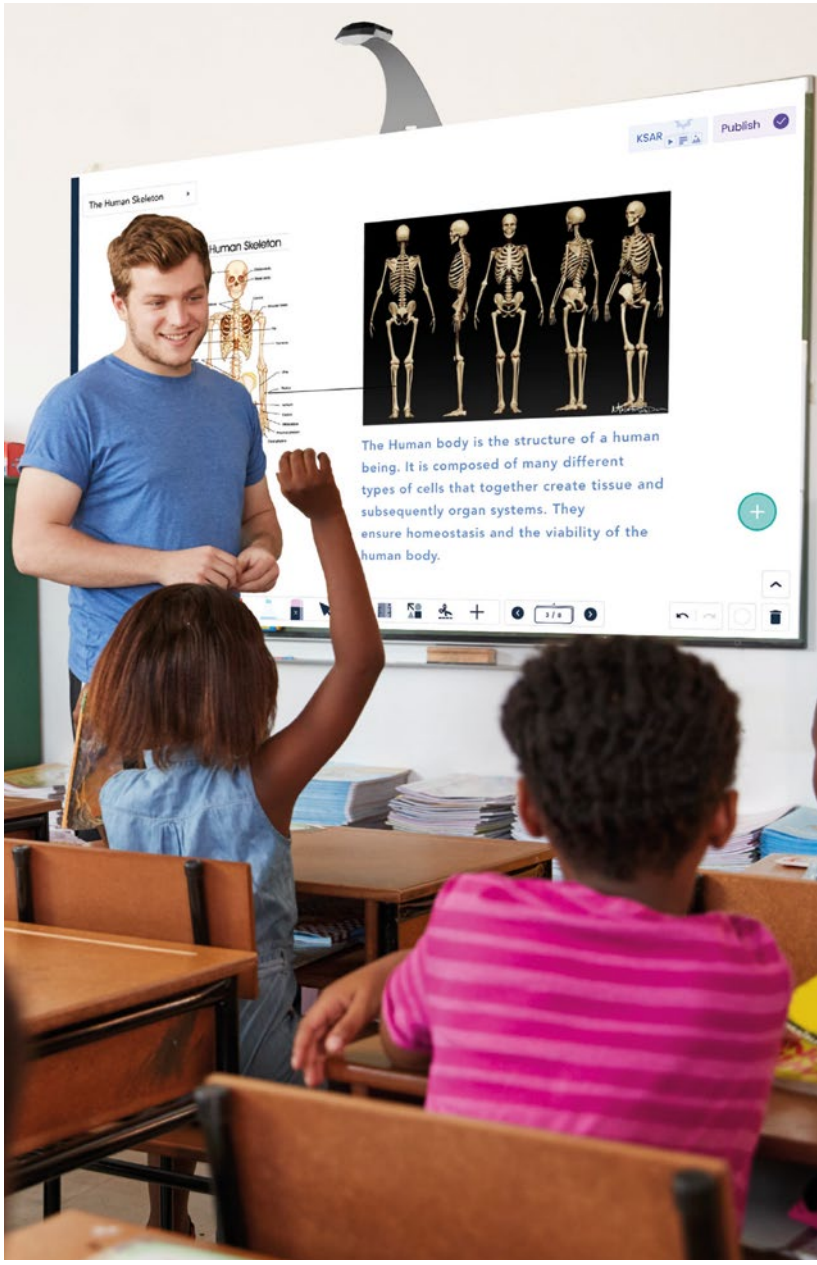
Education has taken a quantum leap forward with tech-aided classrooms. Most of the classrooms are well-equipped with projectors and interactive panels. Kneura helps in upgrading such classrooms by connecting all its dots on the cloud-connected ecosystem.

For traditional classrooms, **Cybernetyx®** has a wide range of cost-effective smart classroom devices in schools, learner's device – a compact student PC powered by Kneura platform, enabling continuity in learning from anywhere, and teacher's device which can be used while teaching from home to give more power to use their TV / monitor as a whiteboard and teach like PRO.

Hybrid Classroom Devices

a. EyeRIS PRO

EyeRIS Pro is an advanced surface -independent wireless touch interactive teaching device that converts any flat projection surface into a touch-enabled digital whiteboard. This projector-based device supports interactivity up to 10 simultaneous touchpoints.



The device is integrated with Kneura platform that allows teachers to create, save, and share their lesson plans on the cloud and access it anytime, anywhere. Kneura offers a separate dashboard to students where they can access the resources shared by teachers.

EyeRIS PRO when connected to a computer or laptop enables screen recording and video conferencing. Just place it on any projector and convert any classroom into a hybrid classroom, enabling face-to-face and remote teaching.

b. Quriosity

Quriosity is an all-in-one device that includes everything needed for a smart classroom. This 4K-UHD interactive panel comes fitted with all the components including immersive display, toughened glass with anti-glare coating, scratch-resistant screen, session recorder, wireless data transfer, ClassEQ Camera, and ClassEQ Mic array.

This interactive panel is connected to the cloud through Kneura platform. With ClassEQ Camera and ClassEQ mic array Mic array, the teacher can connect with all the students, including those who are available in the classroom as well as those joined virtually.

c. Galileo One

Place this device on any regular TV or standard panel and turn it into a full-powered touchscreen via a built-in award-winning EyeRIS optical 3D tracking technology. With ClassEQ Camera Galileo One enables video conferencing as well as captures students' behavior by mapping facial expressions. The ClassEQ beamforming microphone array maintains the clarity of voice and keeps it loud and clear, without distance problems.

Comes with an in-built Kneura platform, making it easier for teachers to create, save, and share lessons through the cloud while students can access the shared and recorded resources anytime, anywhere.

Teacher's Device - Bring your smart classroom home with EyeRIS One, that can turn your TV or monitor into an interactive surface with all the features and tools you use in your classroom.

Record lessons - While the teachers are struggling using different methods to record lessons, EyeRIS One with the built-in lecture capture system allows the teachers to record lessons effortlessly. Since, the whiteboard canvas along with the teacher's video is captured together with high clarity, students get the feel of attending the real classroom session while studying from the recorded lessons at home.

Learner's device - Distributing smartphones is certainly a good initiative taken by the government to encourage digital education among students, but a smartphone is not an education device. With Scholar Plus, students can download the resources shared by the teachers and access it as per their convenience. This device helps students in inculcating self-learning path at their own pace.

Advantages of Hybrid Classroom Devices

These devices - Galileo One, Quorisity, EyeRIS One, Scholar Plus etc. are Hybrid classroom devices that are connected on Kneura platform. The main advantage is the connectivity at every step - which means taught lessons, shared assessments, and graded sheets can be picked from where it was left off. No matter today is the day to teach/learn from school or home, you can always track your last activity and start immediately.

The devices work best on Kneura platform in terms of compatibility and usage but can be used independently too. Even Kneura can be accessed on any device but to get the one-stop-solution, Kneura and its smart classroom devices are highly recommended.

2 Access to Proper Internet Connection

The foremost challenge for enabling online learning in the hybrid classroom is internet availability. Many students from the rural parts of the country experience slow internet connection. The online classes conducted on normal video conferencing tools consume more bandwidth.

In order to deal with the challenge, Kneura has a collaborative whiteboard on which the teacher prepares lessons and teaches during class. During video conferencing, the teaching canvas is not shared rather is available to the students on a web based collaborative mode, so it consumes less bandwidth. Option to attend only audio class with the collaboration canvas is also available. Through this the students will be able to see the actions performed by the teacher in real-time and hear along with the voice. The mode of attending the online class can be selected based on the availability of internet.

Bandwidth Requirements

Scenario	Bandwidth	Use Case
Basic Collaborative Whiteboarding + Audio Conferencing	20- 50 Kbps	Teachers & students can access the same whiteboard with audio conferencing
Collaborative Whiteboarding with Multimedia Content + Video Conferencing	0.5 Mbps	Teachers & students can access the same whiteboard with video conferencing
Collaborative Whiteboarding with Multimedia Content + Video Conferencing + Screen Sharing	1 Mbps	Teachers & students can access the same whiteboard, share screen with video conferencing

Conclusion

The revolution in education has begun. The pandemic has proven that hybrid classroom would be the benchmark for education.

For reopening the schools and being future-ready with digital education, a resilient education system in complete synchronisation with different learning components including the most advanced tools and technologies is required. Also, the cost of fragmented solutions cannot be overlooked that has many unpredictable issues. Kneura is the world's first platform that offers an integrated solution - smart classroom devices on an inteligent platform, making it a perfect fit for Hybrid Classroom.

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