Reimagining Education Through Technology

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Central Square Foundation (CSF) is a non-profit organisation working towards ensuring quality school education for all children in India. Since 2012, CSF has partnered with the government, the private sector, non-profit organisations, and other ecosystem stakeholders to improve the learning outcomes of children, especially from low-income communities. CSF is driven by its mission to enable the school education system to adopt solutions that are scalable, sustainable and effective so that all children get equal access to opportunities needed for leading a better life.

To learn more, please visit: centralsquarefoundation.org.

Disclaimer: Central Square Foundation (CSF) has prepared this document on the basis of information which is publicly available, and sources believed to be reliable. The accuracy of such information has been relied on by CSF to conduct this independent analysis, and has not been verified by CSF. As full disclosure, CSF has awarded grants to Saarthi Education, Top Parent, Rocket Learning, Teacher App and Chimple. We have made every effort to ensure that the information provided in this document is complete as of December 1, 2020.
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   6. Self Learning (SL)
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H Power your own analysis 60
Note from the Founder-Chairman

Over the last three decades, EdTech has shifted from being hardware-oriented to focusing on innovative software that meets students at their own learning levels – no matter where they are or what language they speak. Technology supports and empowers teachers; engages and provides agency to students; and meaningfully involves parents and families in the teaching-learning process. Technology can also collect data to provide valuable insight into how students learn. Growing global evidence has shown that EdTech has the power to leapfrog learning – here in India, and across the world.

Catalytic growth, disruption, and innovation are afoot in the sector, riding now on the wave of increased awareness and demand due to the COVID-19 pandemic. India has been making headlines with EdTech in the recent past, and is only behind North America and China as world leaders in EdTech. We, at CSF, created this analysis to fill the need for a one-stop-source for discovering and understanding the diversity of EdTech innovations that are available today across the world.

This document aims to be a ready reckoner for individual and institutional EdTech adopters. It can help to build a deeper understanding of the current EdTech landscape and predict the future evolutions that will shape the sector.
Introduction: Reimagining education through EdTech

The global market for EdTech unequivocally continues to burgeon and so does its demand – both by institutions and individuals. With innovations rampant in the sector, EdTech presents boundless possibilities to enhance the learning experience.

Who should read this document?
- Policymakers/practitioners contemplating on appropriate EdTech solutions for their context
- Product companies or funders interested in predicting trends, and identifying white spaces and new hypotheses in EdTech
- EdTech enthusiasts interested in learning about the global landscape

Why should you read this document?
- To get a bird’s eye view of the EdTech sector and understand innovative and disruptive hypotheses
- To uncover and visualize how EdTech can transform a traditional classroom and amplify the learning process for teachers, students and even parents

The database powering this analysis can be accessed here for independent analysis and additional information on individual products in the landscape.

K-12 learners in India affected by COVID-19 school closures¹

Projected revenue of the Indian EdTech market in 2022

Indian state governments responses to Covid have included EdTech

Projected value of the global EdTech market by 2026²

Global innovations landscaped for insights in this report

Teaching - learning interactions re-imagined

¹ UNESCO ² GSV Ventures
Overview
Introduction: Innovations in EdTech

**Context**
Technology has been reshaping traditional educational interactions around the world. Innovation in EdTech is ubiquitous and is changing how teaching and learning happens.

- **Innovation is granular**
  Technology is transforming not only broad teaching-learning interactions, but also the granular actions within them (for e.g. how and when feedback is received by a learner).

- **Innovation is scalable**
  EdTech innovations have been able to achieve reasonable scale fairly rapidly, reaching teachers, students, and parents worldwide.

- **Innovation is essential**
  Continuously catalyzing innovation to strengthen and build on value offerings (such as building teacher capacity) is essential for meaningful EdTech adoption.

- **Innovation is pervasive**
  EdTech innovations have proliferated in a range of contexts, from developed to developing countries, leveraging technologies along the spectrum from radio to AI.

- **Innovation is brewing**
  White spaces exist across the teaching-learning spectrum for EdTech, however, the pandemic and mounting global evidence has spurred considerable growth in the sector.

**This Document**
This document aims to provide a deeper understanding of how innovations in EdTech have redesigned multiple teaching and learning interactions across varying contexts around the world led by the following stakeholders – teachers, students, and parents.
## INNOVATIONS IN EDTECH

### Transformation of teaching-learning interactions via technology

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Number</th>
</tr>
</thead>
</table>
| **Lesson Preparation**        | From static to interactive, personalized plans  
Technology allows for creation and dissemination of high-quality plans for more effective instruction with reduced teacher effort. This can lead to a systemic increase in lesson quality. | 41     |
| **Lesson Delivery**           | From sage on the stage to guide by the side  
Technology can transform the role of a teacher from an instructor to a guide that supports students through a personalized learning journey in the classroom — redefining what a classroom looks like. | 65     |
| **Teacher Professional Development** | From mandated to incentivized  
Tech can allow for large scale delivery of quality TPD that provides flexibility and agency to teachers for their own learning.                                                                                                           | 23     |
| **Homework**                  | From task-based to insight-led  
A nascent but disruptive category which envisions automatic creation, dissemination, and correction of homework, allowing teachers to plan for more targeted interventions to support learning.                                                       | 10     |
| **Assessments**               | From exam fever to engaging, automated assessments  
Technology enables and automates the creation of increasingly engaging assessments. Easy collection of reliable performance data can feed into and redefine lesson preparation and delivery.                                                            | 20     |
INNOVATIONS IN EDTECH
Transformation of teaching-learning interactions via technology

**Self-Learning**
- From learning at grade-level to learning at one's pace
- Technology increases the student's agency in directing their learning, via a basket of innovative solutions offering engaging and personalised learning experiences

**Doubt Resolution**
- From being teacher dependent to resolving doubts on demand
- Technology enables greater student independence by provision of on-demand services through virtual communities and AI backed solution repositories to resolve doubts

**Parent-Teacher Communication**
- From receiving information at PTMs to building cohesive parent-teacher communities
- Technology enables increased depth and quality of communication between teachers and parents

**Parental Participation**
- From being a supervisor to becoming a partner in child’s education
- Technology enables parents to increase their own capacity to meaningfully engage in their child’s learning journey

**# of products profiled for this interaction**
Approach
Approach

This document aims to demystify the innovations in the EdTech landscape and present it in an intuitive and user-friendly format. The approach adopted to create this document has been detailed in this section.

1. Landscape
   Innovations identified from across the globe – over 350 innovative K-12 EdTech solutions

2. Categorize
   Mapped the solutions to nine prioritised teaching and learning interactions

3. Synthesize
   Analysed the solutions in each interaction to extract the value that technology has unlocked
The objective of this exercise was to identify innovative EdTech solutions across the globe. To meet this objective different sources that recognise the most promising innovations were explored. Below is an indicative list of categories that were examined to create this document:

- **Awards and competitions** such as CodiE, EdTech Digest, EdTech X, Global EdTech Awards, Global Learning X-Prize, MIT Solve, and the mEducationAlliance.
- **Databases** such as Leapfrogging Inequality (The Brookings Institution) & the Global Learning Landscape (HolonIQ).
- **Market research aggregators** such as Pitchbook, Crunchbase, and Tracxn to source top 10 lists of EdTech solutions in different countries and regions across the world including the US, Canada, China, Finland, Kenya, Tanzania, South Korea, South East Asia, Latin America, MENA, etc.

*Whilst this landscape is not exhaustive, it has aimed to cover enough ground to allow for accurate and thorough analysis of the diversity of innovations that exist in EdTech markets across the globe*
# Categorizing innovations into the nine teaching-learning interactions

<table>
<thead>
<tr>
<th>Teacher-led</th>
<th>Lesson Preparation (LP)</th>
<th>Lesson Delivery (LD)</th>
<th>Teacher Professional Development (TPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher prepares a plan to deliver the lesson</td>
<td>Teacher executes a lesson plan</td>
<td>Teachers engage in learning activities to strengthen &amp; develop their own teaching practices</td>
<td></td>
</tr>
<tr>
<td>Homework (HW)</td>
<td>Assessments (AS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher creates and assigns practice exercises for students &amp; tracks completion</td>
<td>Teachers conduct assessments to gauge progress on learning to inform lesson planning and delivery</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student-led</th>
<th>Self learning (SL)</th>
<th>Doubt resolution (DR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student accesses content to learn independently</td>
<td>Student resolves queries outside class</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parent-led</th>
<th>Parent-teacher communication (PTC)</th>
<th>Parent participation (PP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents engage with teachers/school on their child’s school experience</td>
<td>Parents and families can support a child’s learning at home</td>
<td></td>
</tr>
</tbody>
</table>

**# OF EDTECH SOLUTIONS PER INTERACTION**

![Bar Chart](chart.png)

*Products have been categorized to an interaction basis their dominant use case. However, with their overall offering, they may belong in more than one interaction/use-case.*
Synthesizing the diversity of innovations

As the landscape covered most continents, the idea was to bring out the diversity of EdTech innovations created to solve for similar issues in different contexts. Some of the key questions being sought through the analysis were:

- What technology based solutions have been are prominent in both developing and developed contexts?
- Do solutions exist that have been designed to cater to regions with infrastructural constraints, both in terms of hardware and connectivity?
- What is the relative concentration of products/innovations across different teaching-learning interactions?
- How does moving to technology-enabled learning environments make the learning interaction more meaningful?
- What kind of evidence exists for solutions/innovations?
- How do existing Indian government EdTech solutions map to the global diversity?
Insights
What are the hotbeds for EdTech innovation around the globe?

**Top 5 countries by total funding**

- **China** ($8.7B)
- **India** ($3.1B)
- **United States** ($2.7B)
- **Canada** ($447M)
- **Norway** ($363M)

*As per the landscape for the report*

**Insight**

Innovation in EdTech is happening, both across the globe and across a range of contexts. **Led by North America, China & India** – North America has the most number of innovations while China leads the way in funding. India closely follows, both in terms of number of innovations and funding.
What teaching-learning interactions have seen the most traction and where can we do more?

<table>
<thead>
<tr>
<th>Interaction</th>
<th># of Innovations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Learning</td>
<td>102</td>
</tr>
<tr>
<td>Lesson Delivery</td>
<td>65</td>
</tr>
<tr>
<td>Lesson Preparation</td>
<td>41</td>
</tr>
<tr>
<td>Doubt Resolution</td>
<td>33</td>
</tr>
<tr>
<td>Teacher Professional Development</td>
<td>23</td>
</tr>
<tr>
<td>Assessments</td>
<td>20</td>
</tr>
<tr>
<td>Parent-Teacher Communication</td>
<td>18</td>
</tr>
<tr>
<td>Parent Participation</td>
<td>16</td>
</tr>
<tr>
<td>Homework</td>
<td>10</td>
</tr>
</tbody>
</table>

**Insight**

**Leaders:** Traditional interactions such as Lesson Preparation & Delivery, and Self Learning constitute 67% of the landscape

**Emerging:** Homework and Doubt Resolution backed by Chinese funding

**Laggards:** Teacher Professional Development & Parental Participation have some evidence but need innovation and investment
What is the nature of evidence on EdTech innovations?

In some landscape of solutions, most of the solutions do not have a rigorous experimental study backing them.

- **Type of evidence**: While the product companies led internal evaluations held the largest chunk, around 10% of innovations have been evaluated through RCT or other experimental methods.

- **Evidence across interactions**: While there are a handful of studies on traditional interactions like self-learning and lesson delivery, it is the parent focused interactions that have started seeing some research momentum around them in the recent past.
Low-tech innovation and bridging the digital divide

Insight

Close to 8% of innovations are accessible over feature phones, a device that is nearly ubiquitous around the world, enabling last mile reach.
How to read this document

Four sections are designed for each of the nine teaching-learning interactions

01 Definition of the interaction
- Actions undertaken by stakeholders in the chosen interaction

02 How tech enhances the interaction
- Diversity of EdTech use cases
- Mapping of Indian EdTech govt products
- Demo’s for select cutting-edge products

03 How to operationalise the interaction
- Deep dive on product features
- Device and content required to operationalise the interactions
- Global examples of innovations

04 Case Study
- Single product deep dive as an example of that interaction
- Demo to visualise what the product does in practice
<table>
<thead>
<tr>
<th>Icon</th>
<th>Key</th>
<th>Icon</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>📻</td>
<td>Radio</td>
<td>📱</td>
<td>Student response clickers</td>
</tr>
<tr>
<td>📺</td>
<td>Television</td>
<td>🎥</td>
<td>Video/multimedia</td>
</tr>
<tr>
<td>📡</td>
<td>Satellite television</td>
<td>🧠</td>
<td>Artificial Intelligence</td>
</tr>
<tr>
<td>📱</td>
<td>Feature phone</td>
<td>📍</td>
<td>Mapping of Indian government EdTech solutions against the landscape</td>
</tr>
<tr>
<td>📱</td>
<td>Internet-enabled smartphone</td>
<td>🎥</td>
<td>Click for product demo</td>
</tr>
<tr>
<td>🇮🇳</td>
<td>Internet-enabled laptop/tablet</td>
<td>🛒</td>
<td>Number of products featuring in the landscape analysis</td>
</tr>
<tr>
<td>🧐</td>
<td>Virtual reality (goggles)</td>
<td>🌍</td>
<td>OCR/Image recognition</td>
</tr>
</tbody>
</table>
Teaching & Learning: Reimagined through technology
Lesson Preparation (LP)

Teacher has access to tools and content to prepare lessons, catered to the different learning levels of students in class.

Lesson Delivery (LD)

- Refer to overall syllabus to be completed
- Analyze student learning levels
- Structure lesson plan
- Gather content to deliver the lesson

Activities performed as a part of the current interaction

Activities that are key complements/supplements to current interaction, but are covered in a different interaction
**Lesson Preparation (LP)**
Technology reduces teacher effort to create engaging and personalized lesson plans

<table>
<thead>
<tr>
<th>Text-based lesson plans (structured)</th>
<th>Multimedia enhanced lesson plans</th>
<th>Personalized lesson plans (structured)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unstructured</strong></td>
<td><strong>Structured</strong></td>
<td><strong>Structured and editable</strong></td>
</tr>
<tr>
<td>- Teacher accesses high quality, ready to use lesson plans that are syllabus aligned</td>
<td>- Teacher accesses &quot;laundry-list&quot; of multimedia content (image, audio, videos etc.)</td>
<td>- Teacher accesses virtual communities to collaborate and solicit feedback on lesson plans - “virtual staffroom”</td>
</tr>
<tr>
<td>- But these are only text-based, leaving room to incorporate various content formats</td>
<td>- But, these cannot be edited by the teacher</td>
<td>- But, lesson plans are not automatically differentiated</td>
</tr>
<tr>
<td><strong>Structured and editable</strong></td>
<td><strong>Structured and editable LPs, strengthened through peer community</strong></td>
<td><strong>Structured and editable LPs, strengthened through peer community</strong></td>
</tr>
<tr>
<td>- Teacher accesses editable ready to use lesson plans that are syllabus aligned</td>
<td>- Teacher accesses virtual communities to collaborate and solicit feedback on lesson plans - “virtual staffroom”</td>
<td>- Teacher accesses differentiated lesson plans that are automatically created</td>
</tr>
<tr>
<td>- But, these are still not differentiated plans for the class</td>
<td>- But, lesson plans are not automatically differentiated</td>
<td>- They are built using students’ progress data and learning levels</td>
</tr>
</tbody>
</table>

### Apps/Web/Tech Tools

- LearnZillion
- DIKSHA
- shmoop
- Follett
- Pobble
- Teacherly
- Nearpod

**Indian govt. products**

**Click for product demo**

**#41 products profiled for this interaction**
## Lesson Preparation (LP)
Technology reduces teacher effort to create engaging and personalized lesson plans

<table>
<thead>
<tr>
<th>Sub use-case</th>
<th>Features</th>
<th>Device</th>
<th>Examples of products</th>
</tr>
</thead>
</table>
| Text based lesson plans (structured) | * Modular text files/lesson plan and teacher tips to enhance lesson delivery  
* Easily shareable across various platforms, including Whatsapp | | * Learn Zillion, Bridge Academy Teacher guides, Khan Academy India |
| Multimedia lesson plans | Unstructured | * Open-source content that supports LP hosted on an easy-to-search tool | * Follett My destiny |
| | Structured | * Readymade lessons plans (scripts, videos, worksheets, quiz, etc.) to deliver class  
* Web based interactive repository with links to external resources as well  
* Repository downloadable offline | * Muse by Sabq  
* Shmoop  
* Onion Math, Elimu |
| | Structured, editable | * Create/modify basic elements of a lesson plan like videos, audios, slides etc.  
* Interactive elements like quizzes, polls etc. can be added  
* Collaborate with people to co-create lesson plan | * Pobble, Storyweaver, Chalk  
* Nearpod, Edoome  
* Seesaw, Chalk |
| | Structured editable with peer feedback | * Receive real-time feedback on lesson plan  
* Track teacher performance and display in virtual (local/global) communities | * Teacherly |
| Personalised lesson plans (structured) | * Simple dashboards with student performance data and assistance with cohorting  
* Differentiated lesson plans & resources for different student learning levels  
* Create customized activities for self pace individual work or groups | | * Nearpod  
* ILL  
* Tailor Ed, Edmircro |

*Products with presence in developing nations*
Case study: Nearpod

Lesson Preparation: The only dashboard you need for interactive instruction

What
Nearpod is a platform for interactive instruction delivery for K-12 and beyond - supporting teachers to prepare and deliver great lessons.

Evidence
A recent evaluation showed that 16% & 35% of improvement in English & Math scores respectively can be attributed to usage of Nearpod.

Scale
The company has raised a total of $41.6M as of 2019, has 1.3M teachers and over 5M registered student users around the world.

Demo

Use Nearpod for:
- Your whole lesson
- A video NEW!
- Quick formative assessment
- Gamified activities

Review student work:
Post-session reports

Teach three ways:
- Live Participation
- Student-Paced
- Front of Class NEW!

Convert your:
- PowerPoint
- Google Slides
- PDF
- YouTube video NEW!
- Video file NEW!

Save time:
8,500+ premade, interactive lessons & videos NEW!
Lesson Delivery (LD)

Teacher executes the lesson plan through different modalities

- **Lesson Preparation (LP)**: Teacher delivers content either in-person or via tech platform
- **Assessments (AS)**: Teacher conducts assessments (formative and summative) to plan / modify classroom delivery
- **Teacher resolves student queries in class – resolved immediately by teacher**
- **Homework (HW)**: Teacher assigns practice work for students to strengthen concepts
- **Doubt Resolution (DR)**: Students resolve doubts not solved in class
Lesson Delivery (LD)
Technology enables the teacher provide increasingly personalized instruction to students

<table>
<thead>
<tr>
<th>Degree of personalization</th>
<th>Low</th>
<th>One-way</th>
<th>Interactive</th>
<th>Personalized</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Teacher is an instructor, delivering instruction as learners consume pre-set content</td>
<td>Teacher instructs students to watch content <strong>broadcasted on television</strong> at home</td>
<td>Teacher uses multimedia content (text, A/V) via <strong>smart boards, live tutoring platforms, apps, tablets, computers, etc.</strong></td>
<td>Teacher supports student learning as he/she engages with <strong>immersive learning content via AR / VR and 3D simulations</strong></td>
<td>Teacher uses student performance data to provide <strong>differentiated support</strong> as students engage with <strong>AI driven platforms</strong> with personalised learning content, either in the classroom, remotely via virtual classrooms, or over <strong>live-tutoring platforms</strong></td>
</tr>
<tr>
<td>- Teacher sends content to students via <strong>text message</strong></td>
<td>- But all students interact with the same content and are expected to move at the same pace</td>
<td>- All students learn the same syllabus/content, albeit at their own pace using individual learning paths</td>
<td>- Each student engages with content tailored to their learning needs, at their own pace</td>
<td></td>
</tr>
</tbody>
</table>

**Examples of Tools:**
- **NROER, DIKSHA**
- **matific**
- **Mysticraft**
- **SEESAME WORKSHOP**
- **SMS/WhatsApp**
- **Video/Multimedia**: Indian govt. products
- **AR / VR**
- **App / Web + AI**

**#65 products profiled for this interaction**
# Lesson Delivery (LD)

Technology allows for a teacher to transform into a coach who provides personalized instruction

<table>
<thead>
<tr>
<th>Sub use-case</th>
<th>Features</th>
<th>Device</th>
<th>Examples of products</th>
</tr>
</thead>
</table>
| **Pre-set content**  
*Teacher is an instructor, delivering instruction as learners consume pre-set content*  
A1  
*Multimedia content broadcasted at scale* on TV across grades and subjects  
A2  
*Short, crisp content sent to student via SMS*  
A3  
*Multimedia content* shown to students as a part of lesson instruction i.e. through smart classes that use text, audio/visual content, or over live tutoring platforms and virtual classrooms | ![device icon] | *Sesame Street, BigBadBoo, EduTree* |
| **Interactive content**  
*Teacher is a facilitator, learners independently interact with content at their own pace*  
B1  
*Games* help deliver instructional content and allow teachers to track progress  
B2  
*Students learn concepts through 3D experiences and AR/VR simulations*  
B3 | ![device icon] | *Zoom, Google Classroom,, Blackboard, FrogAsia, ZeduPad, Moodle, OpenEdX, Syafunda, Vedantu, EkStep. OneBillion* |
| **Personalized content**  
*Teacher is a coach, guiding students as tech enables personalized instruction*  
C  
*Personalized adaptive platforms* tailor instruction to learning levels as teachers support in the classroom, remotely over virtual classrooms, and through live tutoring platforms  
C1  
*Data dashboards* allow teachers to see student performance data in real time  
C2  
*Assessments used to diagnose lexile level* of individual students  
C3  
*In class, reading content* on the same topic, provided to students basis their lexile level | ![device icon] | *SmartSparrow, Knowre Math, Geekie, EdGenuity, ChalkTalk, Century Tech, Accelerated Reader, Achieve3000* |
Case Study: ChalkTalk

Lesson Delivery: AI-enabled personalized & adaptive lesson delivery that combines tech with innovative pedagogy

What
ChalkTalk is a personalized & adaptive lesson delivery tool for grade 9-12 math & language

Tech
Leverages AI-predicted learning paths to adapt at the individual, small-group, & classroom levels

Funding
The platform has raised $4.1M as of 2020, & is an alumnus of the Learn Launch & AWS EdStart accelerators

Evidence
Internal evaluations show a 7 point increase in ACT scores, 6.4 times the national improvement average & in 15% less time

4. Personalized practice & remediation
1. Adaptively generated lesson plans for teachers
2. Whole-group instruction
3. Small-group practice & instruction

The ChalkTalk Method
Case Study: onebillion

Lesson Delivery: Multimedia-enhanced personalized & adaptive lesson delivery

What

Onebillion is a personalized, adaptive learning solution for early grades, designed to take a learner from zero to numerate & reading with comprehension.

Tech

Uses an adaptive learning engine to adapt the learning journey to each child, backed by data from thousands of learning units.

Scale

Onebillion has reached over 167K children since 2014 in multiple countries including Kenya, Malawi, India, Tanzania, the UK, & Uganda.

Evidence

As one of the winners of the Global Learning X-Prize, onebillion showed an average gain of ~19.2% & ~23% across multiple domains of literacy and numeracy respectively.

Hundreds of different types of activities designed to teach, practice, and explore literacy and numeracy

Features a library of illustrated books from around the world, and a play zone for practice, exploration, creativity, and learning.

A digital teacher, Alefa, guides children through their learning, giving feedback and encouragement.
Teacher Professional Development (TPD)

In-service teachers leverage digital platforms to strengthen and develop their skills and knowledge for more effective instruction.

Teacher wants to learn and develop knowledge and skills

Teacher selects the medium and content

Teacher engages with chosen content to achieve proficiency

Teacher expands mastery via practice

Teacher Identifies further areas for growth

Lesson Preparation (LP): Teacher has access to teaching and learning materials

Lesson Delivery (LD)
**Focus areas for TPD**

<table>
<thead>
<tr>
<th>Content and conceptual mastery</th>
<th>Effective instructional practices</th>
<th>Digital literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers access content that allows them to improve and achieve mastery over <strong>core academic concepts</strong>.</td>
<td>Teachers access content that enables them to improve their <strong>skills and classroom practices</strong> for effective delivery of instruction.</td>
<td>Teachers access content to <strong>build their capacity for using digital tools in the classroom</strong>. Content can focus on developing skills around usage of EdTech tools or leveraging data to drive technology-supported instruction.</td>
</tr>
</tbody>
</table>

**Delivered via**

- **DIKSHA**
- **The TeacherApp**
- **NISHTHA, DIKSHA**
- **PBS LearningMedia**
- **spongyelephant**

**Social communities**

Teachers learn from local and global teacher communities by sharing best practices, resolving doubts, and collaborating with peers via virtual community platforms.

**At-scale training**

Teachers' professional development is systematically facilitated by institutional channels such as states, districts, implementers, and administrators via customized training modules delivered at scale using tech platforms.

**Certification and micro-credentialing**

Teachers signal their professional capabilities by earning certifications or microcredentials via tools that assess and certify their teaching competencies.
# Teacher Professional Development (TPD)

Technology enables scalability and flexibility of TPD, providing agency to teachers for their growth

<table>
<thead>
<tr>
<th>Focus for TPD</th>
<th>Sub use-case</th>
<th>Features</th>
<th>Device</th>
<th>Examples of products</th>
</tr>
</thead>
</table>
| **A** | Content & conceptual mastery | *On-demand multimedia and textual resources* available through a menu of options categorized by subject, skill, topic, and software  
*Classroom observation tools* that provide feedback to teachers around their classroom teaching practices through live observation remotely by peers, video recordings for self-reflection, and AI-enabled facial recognition to assess student engagement for real-time course correction  
*Feedback tools* that allow peers, students, and administrators to provide feedback to teachers on their content and instruction through digital surveys that are distilled into actionable insights | *TeacherApp, Firki, PBS LearningMedia, EdConnective, SpongyElephant*  
*Teacher FX, Lessonvu*  
*Educator Impact* |
| **B** | Effective instructional practices | *Traditional social media platforms* that allows teachers to connect with each other and share resources  
*Dedicated platforms* for teacher social communities with forums, multimedia exchange, topic feeds, etc. that allow teachers to engage with each other/thought leaders  
*Curated feeds* from multiple social channels and sources that *teachers can customize to their needs* by selecting specific topics, bloggers, or hashtags to aggregate content | *Twitter, YouTube, LinkedIn, Google Plus*  
*TeachersConnect, EdTlena*  
*Feedly, Scoop.it* |
| **C** | Digital literacy | *Digital platforms with pre set or customisable teacher-facing UI/UX that allow school administrators to upload their own training content and deploy to teachers at-scale*, equipped with analytics and dashboards to strengthen monitoring and evaluation efforts  
*Structured online courses/MOOCs* that are self-paced, with active practice opportunities, peer feedback, and assessments | *ChalkLit, EduPlanet21*  
*PBS TeacherLine* |
| **D** | Social Communities | *Online platforms that provide *bite-sized courses*, allowing teachers to *earn digital badges and certificates* against knowledge and skills developed that may be shared across platforms  
*Micro-credentialing platforms* that allow teachers to provide evidence from their teaching practice to demonstrate mastery of skills against standards-based competencies | *Bloomboard, CENTA, Teach.com.au* |
Case study: The Teacher App

Teacher Professional Development: Just-in-time, bite-sized courses for teachers

What
Repository of bite-sized, interactive, high-quality courses for teachers on core concepts, customized to the Indian context

Tech
Open-source multimedia content that is accessible offline, available through the app’s UI/UX built specifically for teachers

Scale
TeacherApp has reached over 3.5M teachers through partnerships with six states in India, and has raised $1M in funding.

Evidence
TeacherApp has seen sustained user engagement since its launch in 2016, with over 10K daily active users and 25K monthly users

Demo
Specialized UI/UX allows users to set TPD goals, choose courses, access teaching and learning material, and connect with peers.

Teachers’ knowledge is assessed at multiple points via interactive questions
Homework (HW)

Teachers assign homework to students in order to strengthen understanding of concepts already taught and delivered in the classroom.
## Homework (HW)

Technology reduces teachers' time and effort to create, assign & ensure compliance for homework

<table>
<thead>
<tr>
<th>Tech for homework dissemination</th>
<th>Tech for homework compliance</th>
<th>Tech for homework creation</th>
<th>Holistic homework platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Teacher <strong>shares homework</strong> with students outside the classroom using <em>generic communication/specific homework platforms</em></td>
<td>- Teacher <strong>reminds students</strong> and parents to complete homework using technology that <strong>automates communication</strong> and reduces teacher effort</td>
<td>- Teacher <strong>creates homework assignments using ready-made resources</strong> or by curating questions through <strong>repositories</strong>, saving time spent on homework creation</td>
<td>- Teacher spends limited time and effort to create, assign, increase compliance and correct homework using end to end aggregated homework platforms that can <strong>automate</strong> these functions</td>
</tr>
<tr>
<td>- But teachers still spend time and effort in homework creation and its completion</td>
<td>- But teachers still spend time and effort in homework creation</td>
<td>- But teachers still spend time and effort in dissemination and ensuring homework completion</td>
<td>- Teachers have end-to-end support for homework including access to insightful data</td>
</tr>
</tbody>
</table>

- **satchel:** Phone / Web based
- **showbie:** App / Web based
- **PowerMyLearning:** App/Web based + AI + OCR
- **Zuoyebang**

**Indian govt. products**

Click for product demo

# 10 products profiled for this interaction
# Homework (HW)

Technology reduces teachers’ time and effort to create, assign & ensure compliance for homework

<table>
<thead>
<tr>
<th>Sub use-case</th>
<th>Features</th>
<th>Device</th>
<th>Examples of products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tech for homework</strong></td>
<td><strong>dissemination</strong></td>
<td></td>
<td>* Phone, SMS, WhatsApp, Email</td>
</tr>
<tr>
<td>A</td>
<td>* Offline and online communication channels to disseminate homework</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Platforms that allow teachers to upload homework for all students at once</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tech for homework</strong></td>
<td><strong>compliance</strong></td>
<td></td>
<td>* SeeSaw, * Firefly Learning * Satchel</td>
</tr>
<tr>
<td>B</td>
<td>* Platforms that ensure compliance by pushing alerts and reminders to students</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Platforms that allow students to upload homework and share with teachers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Platforms that allow teachers and parents to communicate around students’ homework</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tech for homework</strong></td>
<td><strong>creation</strong></td>
<td></td>
<td>* SeeSaw, Firefly Learning, Satchel, * Showbie</td>
</tr>
<tr>
<td>C</td>
<td>* Platforms that provide access to ready-to-use worksheets</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Curriculum-aligned pre-determined activities for students to do with their parents</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Holistic homework</strong></td>
<td><strong>platforms</strong></td>
<td></td>
<td>* HelpTeaching * Power My Learning</td>
</tr>
<tr>
<td>D</td>
<td>* Platforms automatically create homework basis students’ learning levels, teacher is able to assign accordingly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Platforms that automatically correct homework (either in-platform or by scanning worksheets)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Platforms that suggest additional learning content for improvement based on homework performance</td>
<td></td>
<td>* Knowbox * 17Zuoye * Yuanfudao</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>* Zuoyebang * 17Zuoye</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>* Zuoyebang, 17Zuoye, Knowbox, Yuanfudao</td>
</tr>
</tbody>
</table>
Case Study: Homework Helper by Zuoyebang

**Homework:** China’s top aggregated homework platform

**What**
- Zuoyebang’s Homework Helper is an *aggregated homework platform* for K-12 math

**Tech**
- Relies on a question bank of *250 million items* combined with AI-led personalization and OCR

**Scale**
- The platform has raised *$1.3B* as of 2020, and caters to *50M daily active users*, and *170M monthly active users*

---

1. Teachers create homework using the *big-data question bank*
2. Teachers can assign a wide variety of practice exercises from their dashboard
3. Students complete their homework on paper and take a photo for automatic correction via OCR
4. Incorrect questions can be saved for practice later in the form of worksheets

Homework Helper allows teachers to auto create and assign homework. Students can take a photo of written homework for immediate correction and feedback.
Assessments (AS)
(Formative & Summative)

Assessments conducted to regularly track students’ understanding and performance

- Identify and create the questions for assessment
- Assign the assessments to students
- Check the students’ responses
- Provide performance summary and feedback to student

Lesson Preparation (LP) and Lesson Delivery (LD)
### Assessments (AS)

**Technology reduces effort to create engaging assessments**

<table>
<thead>
<tr>
<th>Low</th>
<th>Student engagement</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Limited data for student profile</strong></td>
<td><strong>Complete data for student profile</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Text-based</th>
<th>Interactive</th>
<th>Multimedia-based</th>
<th>Personalized and adaptive</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Tech enables assignment and correction of objective, text-based assessments; including customized assessment paths</td>
<td>- Tech enables easy creation of subjective and objective (with auto correction) assessments in interactive formats, and provides real time student performance data at a deeper level including when students are guessing, key misconceptions etc</td>
<td>- Tech enables creation and auto correction of engaging assessments and providing real time data on student performance</td>
<td>- Tech enables auto curation, assignment and correction of assessments that adapt to the students’ learning level</td>
</tr>
<tr>
<td>- But this does not cater to subjective assessments</td>
<td>- But there is room to increase student engagement</td>
<td>- But do not cater to individual students’ learning levels</td>
<td></td>
</tr>
</tbody>
</table>

**Tools**

- **DIKSHA**
- **AKINDI**
- **Learnosity**
- **Kahoot!**
- **RENAISSANCE Star 360**

**Platforms**

- Phone + Web
- Clickers + Phone + Web + AI
- Web/app based + AI

**Indian govt. products**

- Click for product demo

**#20 products profiled for this interaction**
### Assessments (AS)

**Technology reduces effort to create engaging assessments**

<table>
<thead>
<tr>
<th>Sub use-case</th>
<th>Features</th>
<th>Device</th>
<th>Examples of products</th>
</tr>
</thead>
</table>
| Text-based, objective             | * MCQs shared with students via SMS/Web based communication apps (WhatsApp) or IVR  
* Bubble/scranton sheet used by students to answer MCQs  
* Scranton sheets photographed/scanned for instant correction by anyone  
* Assessment questions include texts, images, audio/visual  
* MCQ quizzes are corrected automatically by the platform  
* Responses submitted to questions include a variety of formats such as images, videos, podcasts, infographics, excel files, online presentations and more  
* Individual student devices not needed, questions broadcasted to class using black or smart board  
* Clickers used for live responses by students in-class or remotely, real time data available for teachers  
* Multiple formats of question types (drag-and-drop, click to count etc)  
* Personalised and aggregated data on many actions undertaken by child  
* Speech recognition, text to speech technology to assess oral reading ability  
* Badges, rewards, leaderboards, competitive team play and other motivational tools in assessments  
* Adaptive assessments that diagnose learning level, augment content and difficulty level of questions basis individual responses  
* Students misconceptions are identified for remediation support | * SMS, WhatsApp, IVRS  
* Akindi  
* Zzish/Quizalize, 789.vn  
* Kritik  
* Qwizdom  
* Quizlet, Learnosity, Pear Deck  
* Google Read Along  
* Kahoot, Nearpod  
* Knewton, Sense.ai, Synap |
Case Study: Star 360

Assessments: Personalized and adaptive assessments for accurate measurement of learning

**What**
- Star 360 is a personalized, adaptive assessment platform for K-12 math and language

**Tech**
- Leverages adaptive technology on 2.8 bn student data points to develop personalized assessments

**Scale**
- Renaissance has raised $40M as of 2014, and Star is used by 34,000+ schools across the US

**Evidence**
- Star provides high reliability while reducing overall testing time to 20 minutes.

**Adaptive Testing**
Computer-adaptive tests, so each student’s testing experience is unique to their learning level, and difficulty-level of questions adjusts as per student responses.

**Accurate Results**
By adapting to students and eliminating unnecessary questions, the platform can accurately measure what students know in real time.

**No repetition**
The system understands how skills relate to one another—and that a student correctly answering advanced items doesn’t need to be tested separately on the basic component skills providing shorter assessments.
Self-Learning (SL)

The student independently learns new content, practices content covered in the class to develop mastery or accesses previous content to address learning gaps.

- Student wants to learn
- Selects the medium and content
- Engages with chosen content
- Learns the concept
- Doubt Resolution (DR)
- Achieves mastery

Expands mastery by exploring advanced concepts.
# Self-Learning (SL)

Technology enables a higher degree of personalization to individual student's learning needs

<table>
<thead>
<tr>
<th>Degree of personalization</th>
<th>Low</th>
<th>Pre-set content</th>
<th>High</th>
<th>Interactive content</th>
<th>Personalised content</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>- Student accesses learning content through public broadcasts following a set timetable</td>
<td>- Student initiates a call to access pre-recorded stories and activities</td>
<td>- Student receives text messages with instructional content, questions and activities</td>
<td>- Student selects A/V content to view basis their own needs/interest</td>
<td>- Student interacts with content in a simulated or augmented reality, enhancing their engagement</td>
</tr>
<tr>
<td>A2</td>
<td>- But student can neither select nor interact with content</td>
<td>- But content is not customized to student’s learning levels</td>
<td>- Student learns concepts via game-based interactive text messages</td>
<td>- Student learns through game based or gamified content platforms, exercising choice on their learning paths</td>
<td>- Student engages with personalized content that adapts to their learning level</td>
</tr>
<tr>
<td>A3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td></td>
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<td></td>
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<tr>
<td>B2</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Swayam Prabha**

**Young love**

**DIKSHA**

**Khan Academy**

**Labster**

**Radio/TV**

**IVRS**

**Messaging**

**TV/Web**

**App / web**

**AR/VR**

**App/Web + AI/ML**

**Indian govt. products**

Click for product demo

# 102 products profiled for this interaction
# Self-Learning (SL)

Technology enables a higher degree of personalization to individual student’s learning needs

<table>
<thead>
<tr>
<th>Sub use-case</th>
<th>Features</th>
<th>Device</th>
<th>Examples of products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-set content</td>
<td>A1 Learning content broadcasted on radio and TV</td>
<td>*Listenwise</td>
<td>*Listenwise</td>
</tr>
<tr>
<td></td>
<td>* Pre-determined schedule disseminated basis grades/subject</td>
<td>*Galli Galli Sim Sim</td>
<td>*Galli Galli Sim Sim</td>
</tr>
<tr>
<td></td>
<td>A2 Student selects the grade and subject via IVRS and listens to audio</td>
<td>*Swayam Prabha</td>
<td>*Swayam Prabha</td>
</tr>
<tr>
<td></td>
<td>stories and lessons</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A3 Number to dial can be a toll-free number</td>
<td>*Phoneshaala</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A4 Students engage with learning content sent periodically via SMS</td>
<td>*SMS/ WhatsApp</td>
<td>*SMS/ WhatsApp</td>
</tr>
<tr>
<td></td>
<td>/ WhatsApp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive Content</td>
<td>B1 Platform responds to learner’s inputs, creating an engaging SMS</td>
<td>*Eneza</td>
<td></td>
</tr>
<tr>
<td></td>
<td>game-based experience; contains live doubt solving by a teacher via</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SMS, literacy games, certificates to the learner, leaderboards and</td>
<td>*Dish TV, Tata Sky</td>
<td></td>
</tr>
<tr>
<td></td>
<td>online search</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B2 Remote control used to interact with satellite TV programs to choose</td>
<td></td>
<td>*DIKSHA, WorldReader</td>
</tr>
<tr>
<td></td>
<td>content</td>
<td></td>
<td>*Khan academy</td>
</tr>
<tr>
<td></td>
<td>B3 Online platform/micro sites hosting curriculum aligned content for</td>
<td></td>
<td>*ABRA, Enuma, Read Along, Graphogame</td>
</tr>
<tr>
<td></td>
<td>students</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B4 Product creates a game-based (with interactive characters, learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ladders etc.) or gamified (rewards, leaderboards etc.) to create an</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>engaging environment</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>B4 VR: Learner uses headset to interact, engage with 3D visual</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>explanations of concepts</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B4 AR: Smartphone camera scans a QR code or an object and displays a</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>virtual 3D model explaining the concept in the phone screen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personalised Content</td>
<td>C2 Predetermined adaptive algorithm that diagnoses misconceptions and</td>
<td>*Labster</td>
<td></td>
</tr>
<tr>
<td></td>
<td>identifies most efficient learning pathway (non AI driven)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C3 AI engine predicts efficient learning pathways basis students’</td>
<td>*Apex Learning, Byju’s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>performance data</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C4 Virtual avatar that examines the learner’s responses, communicates</td>
<td>*Sparkx, MindSpark,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to provide feedback, suggests remediation and encourages the learner</td>
<td>SquirrelAI, Embibe,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to complete their learning journey</td>
<td>ConveGenius</td>
<td></td>
</tr>
</tbody>
</table>

*Products with presence in developing nations*
Each concept is broken into thousands of knowledge points (addressed by videos, examples and practice problems) that are linked to form a knowledge graph.

It can analyze the subtle differences in real time in each student’s learning speed and mastery of each knowledge point, thereby matching personalized knowledge points that students need to master.
Doubt resolution (DR)

Student identifies doubts and queries throughout the learning process, and resolves them by accessing resources that allow him to learn and apply information that was previously unclear.
# Doubt Resolution (DR)

Technology enables students to become increasingly independent in the doubt resolution process.

<table>
<thead>
<tr>
<th>Low</th>
<th>Independence</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td><strong>B</strong></td>
<td><strong>C</strong></td>
</tr>
<tr>
<td><strong>Person dependent</strong></td>
<td><strong>Community dependent</strong></td>
<td><strong>Independent</strong></td>
</tr>
<tr>
<td>Teachers</td>
<td>Online live tutoring</td>
<td>Virtual community</td>
</tr>
<tr>
<td>- Student can <strong>send messages</strong> (text, audio/video) to teachers for immediate doubt resolution</td>
<td>- Student can get help with specific doubts by an expert from an <strong>online pool of teachers</strong></td>
<td>- Student can post queries in <strong>online forms</strong> and get answers from peers and/or teachers</td>
</tr>
<tr>
<td>- But student is dependent on only known teachers, and their availability</td>
<td>- But student is still dependent on tutors’ availability</td>
<td>- But quantity and quality of responses is not consistently reliable</td>
</tr>
<tr>
<td><strong>A1</strong></td>
<td><strong>B1</strong></td>
<td><strong>C1</strong></td>
</tr>
<tr>
<td><strong>C1</strong></td>
<td><strong>C2</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Online content resources</strong></td>
<td><strong>Automated matching to solution</strong></td>
<td></td>
</tr>
<tr>
<td>- Student independently uses resources online, e.g. <strong>search engines, curated repositories</strong> etc. to solve doubts</td>
<td>- Student uploads doubts to a platform that <strong>instantly matches</strong> it to the appropriate solutions</td>
<td></td>
</tr>
<tr>
<td><strong>C2</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **ePathshala Kishore Manch**
- **DIKSHA, NROER, Swayam, NDLI**
- **Revisely**
- **OCR + AI**

- **Indian govt. products**
- Click for product demo
- #33 products profiled for this interaction
### Doubt Resolution (DR)
Technology enables students to become increasingly independent in the doubt resolution process

<table>
<thead>
<tr>
<th>Sub use-case</th>
<th>Features</th>
<th>Device</th>
<th>Examples of products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A1</strong> Teachers</td>
<td>* Doubts shared via text messages or calls with teachers&lt;br&gt;* Doubts shared via web-based communication platforms (text, audio and visual formats) with teachers&lt;br&gt;* On demand service to match learners with tutors for specific doubts; either basis location of student or agnostic of it</td>
<td>![device icon]</td>
<td><em>WhatsApp&lt;br&gt;</em> WhatsApp, Skype</td>
</tr>
<tr>
<td><strong>A2</strong> Online live tutoring</td>
<td>* Crowdsourced answers from online communities around the globe&lt;br&gt;* Closed group forum discussions at school, grade or classroom level&lt;br&gt;* Doubts shared in multimedia formats</td>
<td>![device icon]</td>
<td><em>Chegg, Brainly&lt;br&gt;</em> Piazza&lt;br&gt;* Embibe</td>
</tr>
<tr>
<td><strong>B1</strong> Community dependent Virtual community</td>
<td>* Read solved examples for questions in textbooks and past papers via curated online repositories&lt;br&gt;* Use keywords search for explanation pertaining to specific doubts in multimedia formats (text, audio/visual)</td>
<td>![device icon]</td>
<td><em>Revisely, NCERT Solutions&lt;br&gt;</em> Khan Academy, YouTube</td>
</tr>
<tr>
<td><strong>C1</strong> Online Content Resources</td>
<td>* Instant doubt resolution via sms/web-based platforms that use ML and AI&lt;br&gt;* Photos of doubts uploaded to platforms that automatically detect the text (using OCR tech) and provide pre-matched detailed explanations in multimedia formats&lt;br&gt;*Online calculator for advanced mathematics</td>
<td>![device icon]</td>
<td>*Mtabe, Whatsapp&lt;br&gt;*<em>Doubtnut, PhotoSolver by GotIt!, 17Zuoye, Photomath&lt;br&gt;Microsoft Math Solver&lt;br&gt;</em> Symbolab</td>
</tr>
<tr>
<td><strong>C2</strong> Automated matching to solutions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Case Study: PhotoStudy

**Doubt Resolution:** Live tutoring for instant doubt resolution

**What**
PhotoStudy by GotIt! is an instant math and science doubt resolution tool for grades 9 and above.

**Tech**
Uses an **AI-powered bot** to provide instant doubt resolution, or **connects the student to a live tutor** for further explanation.

**Scale**
The platform has raised $22.5M as of 2015, and more than a million students around the world have used the app to solve 3M doubts.

**Evidence**
Internal evaluations show that 90% of students who used PhotoStudy saw at least a letter grade improvement in their Math/Science course.

---

1. Take a picture of your doubt or question
2. Choose to have it solved by an AI-powered bot or connect with a tutor for a live session
Parent-Teacher Communication (PTC)

Teachers / schools leverage digital platforms to strengthen teacher-parent communication.

1. Teacher identifies the need to communicate with the parent.
2. Teacher creates the communication.
3. Teacher sends it through the platform.
4. Parent receives the update from the teacher.
5. Parent acknowledges and acts upon the communication.
# Parent-Teacher Communication (PTC)

**Technology enables increased depth and quality of engagement between parents and teachers**

## One-way Information Sharing

<table>
<thead>
<tr>
<th>Level</th>
<th>Information Sharing Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Broadcast</td>
<td>- Parent receives updates about school events through locally produced TV programs and radio shows</td>
</tr>
<tr>
<td></td>
<td>Helpine numbers</td>
<td>- Parents can call a school / district helpline for pre-recorded updates</td>
</tr>
<tr>
<td></td>
<td>Text messages</td>
<td>- Parents receive information via text messages from teachers/school</td>
</tr>
<tr>
<td>High</td>
<td>Multimedia communication via generic platforms</td>
<td>- Parents can engage in a dialogue with teachers leveraging existing communication platforms</td>
</tr>
</tbody>
</table>

## Two-way Information Exchange

<table>
<thead>
<tr>
<th>Level</th>
<th>Communication Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Textual communication via dedicated platforms</td>
<td>- Parents receive updates and can keep track of child’s learning and activities at school</td>
</tr>
<tr>
<td>High</td>
<td>Multimedia communication via dedicated platforms</td>
<td>- Parents and teachers can communicate using multimedia messages and create engaging virtual communities</td>
</tr>
</tbody>
</table>

## Tools

- ParentSquare
- ClassDojo

---

**Indian govt. products**

Click for product demo

# 18 products profiled for this interaction
Parent-Teacher Communication (PTC)
Technology enables increased depth and quality of engagement between parents and teachers

<table>
<thead>
<tr>
<th>Sub use-case</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast</td>
<td>* School produced content (recorded student activities, student shows, logistical info etc) to update the parent community via TV/radio</td>
</tr>
<tr>
<td>Helpline numbers</td>
<td>* 24/7 IVRS number available for parents to call to obtain info on school events/admin/meetings</td>
</tr>
<tr>
<td>Text messages</td>
<td>* SMS sent to parents with school updates, student attendance and performance information * Customize messages by personalisation of names</td>
</tr>
<tr>
<td>Multimedia communication via generic platforms</td>
<td>* Teachers and parents can exchange multimedia updates (including pictures, videos) wrt to student learning activities * Parent-teacher meetings can be conducted on virtual platforms * Dashboards for teachers to schedule messages * Tracking of read receipts * Automatic in-app language translation for multilingual communication * Pre-designed responses for parents to revert * Privacy protection of both parties</td>
</tr>
<tr>
<td>Textual communication via dedicated platforms</td>
<td>* Dashboard on student learning data and teacher feedback available * Multi lingual updates can be scheduled with read receipts * Quiet hours for teachers to decide communication windows with parents * Efficient school admin processes e.g. fee payments</td>
</tr>
<tr>
<td>Multimedia communication via dedicated platforms</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Devices</th>
<th>Examples of products</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Phone" /> <img src="image" alt="Radio" /></td>
<td>* Parkhill TV, Lodgers Berwick radio</td>
</tr>
<tr>
<td><img src="image" alt="Phone" /> <img src="image" alt="Phone" /></td>
<td>* Karnataka</td>
</tr>
<tr>
<td><img src="image" alt="Phone" /> <img src="image" alt="Phone" /></td>
<td>* FollowClass * ParentAlert</td>
</tr>
<tr>
<td><img src="image" alt="Phone" /> <img src="image" alt="Phone" /></td>
<td>* Whatsapp</td>
</tr>
<tr>
<td><img src="image" alt="Phone" /> <img src="image" alt="Phone" /></td>
<td>* Zoom, Teams</td>
</tr>
<tr>
<td><img src="image" alt="Phone" /> <img src="image" alt="Phone" /></td>
<td>* Remind * Sync * SchoolVoice</td>
</tr>
<tr>
<td><img src="image" alt="Phone" /> <img src="image" alt="Phone" /></td>
<td>* ParentSquare * ClassDojo</td>
</tr>
</tbody>
</table>
Case Study: Parent Square

Parent Teacher Communication: Two-way communication between parents and teachers

What
Platform connecting K-12 schools and families for seamless communication for all school related activities

Scale
Parent Square has 2 million users across 44 states in the US and has disclosed $4.2M in funding

Tech
Teacher quiet hours, in-app translation, personalized messages to parents

Mass Notifications

- Urgent Alerts
  Send with a few clicks
- Attendance/Lunch Balances
  Day/period absences + excuse notes

Classroom Communications

- Direct & Group Messaging
  Connect students, teachers, parents
- Parent-Teacher Conferences
  Save time, increase bookings

School Services

- School Directory
  Automatically updated from your SIS
- Invoices & Payments
  Accept secure online payments

Demo

Volunteering & Sign-ups
Fill needs faster, chase less.

Newsletters
Streamline, ensure brand consistency
Parental participation (PP)

Parent uses tools to engage with their child’s learning (academic and SEL) at home and build their own capacity to do so meaningfully.
Parental participation (PP)

Technology enables parents to provide increased level of learning support to their children

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content broadcast</strong></td>
<td><strong>One-way content sharing</strong></td>
<td><strong>Two-way communication to facilitate engagement with content</strong></td>
<td><strong>Homeschooling platforms for parent to engage with child’s learning</strong></td>
<td><strong>Content to build parents’ capacity to drive child’s learning</strong></td>
</tr>
<tr>
<td>- Parent accesses <strong>learning content broadcasted on TV</strong> to engage with the child</td>
<td>- Parent receives <strong>activities to conduct with child through SMS/IVRS</strong></td>
<td>- Parent can <strong>discuss and get assistance</strong> to conduct the activities better with the child</td>
<td>- Parent uses a platform to select <strong>learning content</strong> for their child and <strong>access dashboards</strong> to keep a track of their performance/progress</td>
<td>- Parent engages with nuanced, targeted information that equips them with the <strong>skills and knowledge to drive</strong> the child’s learning and development process</td>
</tr>
</tbody>
</table>

- **ubongo**
- **Ready4K**
- **Makhalidwe Athu**
- **Sattorhi**
- **K12**

- TV
- Messaging/Calls
- Web platforms
- Web platforms

**Indian govt. products**

**Click for product demo**

**# 16 products profiled for this interaction**
# Parental participation (PP)

Technology enables parents to provide increased level of learning support to their children

<table>
<thead>
<tr>
<th>Sub use-case</th>
<th>Features</th>
<th>Device</th>
<th>Examples of products</th>
</tr>
</thead>
</table>
| A Content broadcast | * Learning activities broadcasted via edutainment channels on television  
* Videos uploaded on shared tablets at community locations weekly | 📺 | * Ubongo (Tunakujenga) |
| B One way content sharing | * Learning activities sent out as text-messages at regular intervals  
* Activities range across different domains - art/craft, health/hygiene, numeracy, language etc  
* Activities designed to target student learning levels  
* Tips provided to parents on child development to deepen engagement  
* Parents call an IVR line which will tell them the story of the week along with a discussion question | 📱 | * Makhalidwe Athu, Delhi govt  
* Dost edu, Ready 4K  
* Botswana - Young love |
| C Two-way communication to facilitate engagement with content | * Dedicated relationship manager calls parents to communicate activities/tips  
* Operators available on call to clear doubts, provide support or additional material to parents | 📞 | * Makhalidwe Athu  
* Saarthi |
| D Homeschooling platforms for parent to engage with child’s learning | * Online platforms with learning content for child to engage with directly  
* Parents choose classes and create the learning journey for the child  
* Dashboards that allow parents to track child’s learning journey | 📱 | * Homeroom, K12, Outschool |
| E Content to build parents’ capacity to drive child’s learning | * Online platforms with parent facing content spanning across different aspects of child development including nutritions, managing relationships, safety/security of children etc.  
* One-stop shop for parents to access high-quality learning resources for children | 📱 | * Top Parent |
Case Study: Ready4K!

Parental Participation: A communication tool to help parents meaningfully engage in their child’s learning

**What**

Ready4K! delivers a family engagement curriculum to K-3 parents via personalized text messages.

**Tech**

Uses an adaptive engine to send personalized SMS messages on any device.

**Scale**

The platform has raised $3.7M as of 2019, and more than 300K families across the US use Ready4K.

**Evidence**

A series of RCTs have shown that the approach can accelerate literacy outcomes by 2 to 3 months over a school year.

**Demo**

Family Engagement Curriculum, delivered via text

FACTS inform parents about the skill of the week and the importance of that skill for academic growth of the child.

TIPS suggest an easy, at-home activity based on that skill.

GROWTH messages contain a more advanced activity that is meant to extend the learning opportunity presented earlier in the week.
Power your own analysis

The database powering the analysis in this document is available for open access.

A deeper glance through the database can provide you more information -

- **On the broader EdTech landscape** - e.g. “Which use-cases of EdTech have most evidence of impact?”
- **On very specific questions such as** “What are some parental engagement products I can look at as I think about solutions for my district?”

Access the database to discover interesting products across different geographies, devices, grades and subjects. Information on funding, scale and evidence is also included where available. From over 350+ innovations landscaped, this database features 328 innovations categorized into the nine teaching-learning interactions.
Authors
Rashi Dhanani  |  Shruti Gogia  |  Rhea Handa  |  Dhruv Kamath

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To tell us about an innovative EdTech solution, provide feedback, or suggest corrections, please fill this form.

For any queries, please write to us at info@centralsquarefoundation.org.