

# Request for Expression of Interest: Personalized Adaptive Learning platforms in Andhra Pradesh

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## I. Introduction

While access to education has significantly improved across India over the past few decades<sup>1</sup>, learning outcomes have not. In fact, various national, international and independent surveys point to the low, and in some cases, even declining student outcomes in the country. To illustrate, grasping foundational skills such as mathematics and language has been diminishing. According to the National Achievement Survey data for Class 5, **there has been a 6% to 33% decrease in learning levels between 2012 and 2015** for mathematics, language and environmental studies.

### The case for Personalised Adaptive Learning

To ameliorate poor student learning outcomes in the country, the Ministry of Human Resource Development (MHRD), Government of India (GoI) has advised states getting on a path to adopt Personalized Adaptive Learning (PAL) solutions, and earlier this year MHRD issued “Implementing personalised adaptive learning (PAL) at schools: A guidance note for states”. PAL emphasizes the tailoring of teaching instruction to the learning levels of each child and leading the child towards his or her unique learning trajectory. This pedagogic approach involves diagnosing the child’s comprehension for specific basic competencies, instead of testing for the child’s knowledge on a broad topic. Once diagnosed, the child is led toward his or her unique learning trajectory through a finite number of carefully designed questions, remediating with appropriate content where needed. For example, a specific subject could be broken down into key topics (e.g., whole number concepts), subsequently into clusters (e.g., counting and grouping up to 100), and later into questions in sequence of difficulty. This would provide a comprehensive understanding of each cluster to the student<sup>2</sup>.

As detailed in the guidance note published by GoI, there is significant existing evidence about the effectiveness of PAL solutions. A paper by Philip Oreopoulos and Andre Nickow for J-PAL reviewed dozens of Randomised Controlled Trials (RCTs) involving Ed Tech. The research found that in nearly all the 41 studies that compared pupils using adaptive software with peers who were taught by conventional means, the software-assisted pupils received higher scores. In most studies, language scores achieved were higher, too.<sup>3</sup> An extensive review of existing studies from across the world on Computer Assisted Learning (CAL) interventions found that hardware-focused interventions that provide computers at home or at school seem to have no positive impact on learning outcomes. Pedagogy-focused CAL programs that allow students to review grade-appropriate content at their own pace were found to do better, but the gains were modest and ranged from  $0.1\sigma$  to  $0.2\sigma$ . Finally, the interventions that delivered the largest gains appeared to be those that use technology to also personalise instruction (Muralidharan, Singh, and Ganimian 2017)<sup>4</sup>.

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<sup>1</sup> The gross enrolment ratio is up from 79% in 1990 to 97% in 2015, driven largely by efforts to build 7 lakh new schools and adding 45 lakh teachers during this period. [“STATISTICS OF SCHOOL EDUCATION”, 2014, MHRD, GoI; “School education in India – flash statistics 2014-15”, National University of Educational Planning and Administration, 2015]

<sup>2</sup> “Implementing PAL at schools: A guidance note for states”, issued by MHRD, GoI in May 2018

<sup>3</sup> “Technology is transforming what happens when a child goes to school”, The Economist, July 2017

<sup>4</sup> “Disrupting Education? Experimental Evidence on Technology-Aided Instruction in India”, Muralidharan, Singh and Ganimian, July 2017

Within India, initial results have been very promising. In 2015-16, a randomized control trial of personalized and adaptive software across 619 students from government-run secondary schools in low-income neighbourhoods in Delhi showed an improvement in Mathematics and Hindi test scores by  $0.37\sigma$  and  $0.23\sigma$  respectively over a 4.5-month period.<sup>5</sup> Rapid adoption by private schools is further evidence that the solution is seen as being effective and efficient. While PAL penetration is growing, most efforts remain small-scale, and the time is ripe to implement a large-scale roll-out that truly harnesses the potential of this technology.

### Andhra Pradesh: at the forefront of adopting technology in the classroom

As part of its ambitious Vision 2029, the GoAP has identified “Transforming Education to Produce Future Workforce” as a key priority. Specifically, the AP Department of School Education has recognised the potential for EdTech to enhance teaching and learning in its government schools, and the state has been at the forefront of introducing innovative EdTech initiatives in India. It has acquired valuable technical capacity to procure and implement EdTech through a Project Management Unit (PMU). Recent EdTech initiatives include the AP e-knowledge Exchange Portal (APEX), Janmabhoomi digital classrooms, virtual classrooms, biometric attendance tracker, computer-based tests and teacher recruitment tools, as well as a long tail of smaller-scale philanthropy-backed pilots. In addition, programs like ASPIRE in collaboration with tech companies and the Andhra Pradesh State Skill Development Corporation (APSSDC) have started to introduce vocational programs that teach coding, computational thinking, virtual reality, robotics, and others, for example across ~400 tribal and social welfare schools.

AP has already invested in building an innovative ecosystem that can support the implementation of these pilots and their eventual scale-up. AP recognised that teachers play a central role to EdTech delivery and are an untapped resource for content creation. To build engagement, the PMU held workshops with teachers from across the State as well as experts from the private sector to socialise leveraging EdTech and get feedback on use cases. Thousands of schools already have experience with digital or virtual classrooms, many have computer lab infrastructure, as well as teachers who are computer-savvy. To place the student at the centre of learning, and significantly improve student learning outcomes over time, the GoAP has set up digital classrooms (DCR) in over 3,000 schools across and virtual classrooms in over 1,000 schools. Further, ICT Labs are present in over 500 schools.

Starting from this strong base, the **GoAP wants to be the first state to adopt PAL at scale** and generate learnings on how to accelerate student learning outcomes across a large cohort of school-going children. To this end, the AP PMU will commence a large PAL procurement effort. The initial plan is to kick-off a PAL proof-of-concept phase with selected vendors across the state in the academic year 2018-19. These proof-of-concept phases will run from late December until the end of the academic year, after which AP aims to implement PAL in up to 2,647 schools for academic year 2019-20.

### Request for Expression of Interest

The GoAP is inviting Expressions of Interest (Eoi) from PAL software vendors. During the proof-of-concept phase (i.e. from December 2018 until the end of the academic year in May 2019), shortlisted vendors will be assigned a set of 10 to 30 schools in which to deploy their PAL solution. Hardware will be provided by the state.

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<sup>5</sup> “Disrupting Education? Experimental Evidence on Technology-Aided Instruction in India”, JPAL, 2018

Shortlisted vendors that demonstrate strong operational milestones and readiness to scale will be empanelled for the scale-up phase in the academic year 2019-20 to reach up to 2,647 government schools. While there is budget to reach 2,647 schools in academic year 2019-20, all schools may not be eligible for the first-year roll-out. Scale-up vendors will be selected by March 2019.

**Responses to the Expression of Interest must be submitted by 5:00PM on 8<sup>th</sup> December. Vendors must be prepared to make in-person presentations in Vijayawada on 10<sup>th</sup> December and 11<sup>th</sup> December.**

*Please refer to the ToR for more details on Overview of the Tendering Process.*

## II. Terms of Reference

Vendors must respond to this EoI in order to be considered for the proof-of-concept phase of the project (from December 2018 until the end of the academic year in May 2019). Only vendors that are selected to participate in the proof-of-concept phase will be eligible for scale-up empanelment. There will be no further opportunity after this EoI for additional PAL vendors to submit bids or proposals to participate in the scale-up, which will take place over academic year 2019-20 and cover up to 2,647 schools.

While the state will provide hardware in all schools for the proof-of-concept phase, GoAP will run a separate tendering process for hardware providers and system integrators for the scale-up phase. Therefore, for the proof-of-concept phase, selected PAL software vendors will be responsible for system integration (*please refer to the other roles and responsibilities for PAL software vendors in EoI*).

### Planned Implementation Road Map

GoAP aims to scale PAL in up to 2,647 government schools across the state in academic year 2019-20 (implementation may be limited to a subset of these schools if all are not found to be ready for PAL). The delivery model during the scale-up will be through a systems integrator (to be identified through tender process) who will work with empanelled PAL software vendors and provide hardware in schools.

In order to become an empanelled software vendor, PAL providers who meet eligibility criteria defined in Section III below will first participate in a proof-of-concept phase from December 2018 to May 2019. During the first 6 to 10 weeks of the proof-of-concept period, vendors will be reviewed based on the criteria defined in Section IV below. Based on these reviews, vendors will be selected for scale-up empanelment.

During the proof-of-concept period, the state will provide hardware in all proof-of-concept schools and may offer funding related to teacher expenses to attend trainings and workshops.

Figure 1 below summarizes the envisioned PAL implementation roadmap.

Proof-of-concept Phase (AY 2018-19)	First Year Scale-up (AY 2019-20)	State-Wide Roll-out (AY 2020-21 and beyond)
<ul style="list-style-type: none"> <li>Develop <b>proof-of-concept</b> solution with selected vendors in up to <b>200 schools</b> and <b>prototype</b> solution to fit local context and constraints</li> <li>Allocate vendors in proof-of-concept and prototyping phase <b>10 to 30 schools</b> to implement PAL solution free-of-cost</li> <li>Identify vendors that can deliver for scale up (<i>please see evaluation parameters defined in EoI</i>)</li> <li>Create plan for scale-up</li> <li>Select and enter agreement for hardware procurement, software procurement, and system integrator</li> </ul>	<ul style="list-style-type: none"> <li>With selected vendors, sign <b>performance-linked contracts</b> to scale PAL in up to <b>2,647 schools</b> (hardware and software delivered and in use)</li> <li><b>Continue learning process</b> as scale-up is rolled out</li> </ul>	<ul style="list-style-type: none"> <li><b>Scale up across the state in a phased manner</b></li> <li>Performers to be allotted more schools, and course-corrections to be made for under-performers</li> <li>Conduct tendering process for new vendors on rolling-basis</li> </ul>

### Overview of Tendering Process

- **Open** and **competitive** EoI to select PAL vendors.
- Each vendor may only submit one EoI.
- This document is made available online on [www.schooledu.ap.gov.in](http://www.schooledu.ap.gov.in)
- EoI to be **submitted** by 5:00PM on **8<sup>th</sup> December**, and invited vendors must be prepared to make in-person presentations in Vijayawada on **10<sup>th</sup> December and 11<sup>th</sup> December**.
- The EoI must be submitted **both** through email and offline
  - Email to [pal@apschooledu.in](mailto:pal@apschooledu.in) with subject line as **PAL-EOI-Submission**
  - Submit a hard copy of EoI to:
 

The Commissioner of School Education, Government of Andhra Pradesh,  
Sri Anjaneya Towers, Road No. 7-104, B-Block,  
4h Floor, N.T.T.P.S. Road, Ibrahim Patnam,  
Amaravati, Vijayawada, Krishna District, 521 456

- Vendors may submit questions any queries related to this EoI to [pal@apschooledu.in](mailto:pal@apschooledu.in) by **1<sup>st</sup> December 2018** with subject line as **PAL-EOI-Query. Any queries received after this date will not be addressed.**
- Selected vendors from EoI to **implement** PAL in 10 to 30 schools, **until the end of academic year 2018-19** (that is, throughout the proof-of-concept and prototyping phase defined in the implementation roadmap).
- PAL vendors **empanelled for scale-up** will be identified by March 2019 using evaluation parameters summarized below. The empanelled vendors will be selected from the set of proof-of-concept vendors, and there will be no further opportunity after this EoI for additional PAL vendors to submit bids or proposals to participate in the scale-up. While the review of PAL vendors will take place for the first 6 to 10 weeks of the proof-of-concept phase, all vendors must **continue to support** the proof-of-concept phase for the rest of the academic year (i.e. until May 2019). This is to avoid disrupting classrooms due to excessive change. The PAL vendors will benefit from the proof-of-concept phase as GoAP and its partners will promote cross-learning by continuously sharing results, key success factors, and lessons learned. Additionally, participating till the end of the academic year will also help PAL vendors build their profile and potentially aid their bid for future PAL implementations in AP and beyond. This is therefore a unique opportunity for vendors to learn from the proof-of-concept phase and adapt their solutions and build their respective profiles.
- In the scale-up phase starting academic year 2019-20, empanelled vendors will work with system integrators selected by GoAP through a separate tendering process.

### Profile of Schools

The proof-of-concept schools will be selected from a list of schools that closely represent the (average) profile of the **2,647 scale-up schools** that budget is allocated for in academic year 2019-20. These schools are:

1. Spread across 13 districts, and **90-95% in rural areas**
2. **~60%** of schools have **both** English and Telugu as the medium of instruction
3. **~100%** of schools have **classes 6 to 10**, which is the focus for this intervention
4. **Average class size** of 50 to 60 students for classes 6 to 10 (which is the focus for this intervention)

Please note:

1. Given that PAL vendors may not have assessments and content in Telugu for the proof-of-concept phase, schools will be selected to ensure higher levels of English proficiency already exist. Having said that, PAL vendors will be expected to develop Telugu content and assessments to be considered for the scale-up phase starting in academic year 2019-20.
2. While several schools will have enough teacher capacity, consistent power supply and strong internet connectivity *not all* schools will have the same sophistication of infrastructure and resources. Learnings from the first phase of implementation regarding optimal conditions for a PAL roll-out will be used to help the GoAP set other state schools up for success and mitigate risk during the implementation process.

### Characteristics of Personalized Adaptive Learning (PAL) Platform

Education technology solution must focus on delivering both “personalized” and “adaptive” learning, tailoring instruction to the learning levels of each child and leading the child up his or her unique learning trajectory. Towards that end, the PAL solution must:

1. **Identify the child’s baseline and assess his or her learning gaps** at the concept and sub-concept level through diagnostic assessments
2. Decompose learning ladder and **construct optimal learning pathway** tailored to each child’s needs
3. **Remediate the child for each competency deficiency** through engaging content, delivered at the right level
4. **Adapt the learning pathway in real-time** based on student needs

Furthermore, the platform must also provide **robust student and teacher dashboards** (preferably in real-time, and cumulatively) that assess student’s baseline and learnings gaps at the concept level, and produce student-wise and class-wise progress reports

### Product and Implementation Design

Given the nature of this project, and the profile of GoAP schools, the PAL platform must have the ability to incorporate the following attributes into **product design** for

#### **Proof-of-concept and Prototyping Phase in AY 2018-19:**

1. Assessments and content **mapped with the Andhra Pradesh state board curriculum** for classes 6 to 10 for Mathematics and/or English and/or Telugu
2. Assessments and content (including script and audio) to be available in **conversational English or Telugu** (if available)

#### **Roll-Out of PAL starting AY 2019-20:**

1. Assessments and content to be developed for teaching **English language, Telugu language, and Mathematics**
2. **State Council of Educational Research and Training (SCERT) certification** required for Mathematics, English, and Telugu subjects
3. Assessments and content for **all subjects** (including script and audio) to be available in **conversational Telugu**
4. **Other subjects** (*in addition to* Mathematics, English, and Telugu) *may be* included under PAL implementation as per GoAP’s discretion

Please note that PAL vendors may use SCERT support to develop content and assessments for teaching Telugu language *or* translate content and assessments for other subjects into Telugu. Any content developed with support from SCERT for developing or translating content and assessments will be considered **open source** and free to use.

Over the duration of **proof-of-concept** phase, the PAL vendor must:

1. Provide the solution until end of academic year 2018-19 in 10 to 30 schools **free of cost** (not including hardware and maintenance, which will be provided by GoAP),

2. Appoint a **dedicated state-level PAL coordinator** to coordinate with GoAP's Project Management Unit (PMU), and ensure smooth operations and quality of outcomes in proof-of-concept phase
3. Appoint **field-management service employees** (on organization's payroll or through external organization) such that there are no more than 4 schools per field management services staff
4. Ensure that PAL solutions are **set up for success** and offer **implementation support**. Some examples of what this might include are efficient ticket management/ grievance redressal systems, timetabling support, teacher training, on-demand query resolution, and troubleshooting help for PAL platform (*not hardware*)
5. Prepare and provide **Standard Operating Procedure (SOP)** for all processes required to successfully conduct PAL sessions in class
6. Conduct an **induction training for teachers** to use the PAL platform effectively
7. Collect data on various metrics (detailed later) and prepare **monthly status reports** per each school for the GoAP. Further, through the proof-of-concept phase, PAL vendors will be required to **share aggregate MIS data** with GoAP (and DIKSHA/ APEKX) on **ongoing basis** and upon request to promote monitoring, evaluation, and learning in the ecosystem and promote better uptake of PAL in the scale-up.

## Roles and Responsibilities for Implementation of PAL

- A. *Roles and Responsibilities for **Software Vendors and Implementing Partners** (i.e. field management service providers, if different from software vendor) (not exhaustive)*
  1. Curriculum-linked personalized adaptive learning content and assessments for English language and/or Mathematics and/or Telugu language during the proof-of-concept phase, and English language, Mathematics, and Telugu language for the scale-up in academic year 2019-20 (other subjects may be chosen for implementation later)
  2. Assessments and content available in conversational English and/or Telugu for the proof-of-concept phase; assessments and content must be available in conversational English and Telugu for the scale-up
  3. SCERT approval for assessments and content of all subjects (not required for proof-of-concept phase but required for scale-up)
  4. Training curriculum and SOPs for training coordinators, headmasters, and teachers
  5. Workplans for support staff
  6. System integration for proof-of-concept phase *only*
  7. Sensitize, engage and onboard students, teachers and administrators for use of PAL
  8. Train headmasters and teachers to use PAL, troubleshoot, and remediate using diagnosis and conduct timetabling and lesson planning workshop with headmaster and teachers
  9. Operate efficient ticket management/ grievance redressal system to ensure smooth operation of PAL software
  10. Assess learning gaps, and build missing competencies through remediation pathways
  11. Conduct refresher trainings for headmaster and teachers periodically and on-demand
  12. Update software features and learning modules as and when necessary
  13. Provide data collection logs and protocols

14. Deploy a Management Information System (MIS) and dashboard, and share **aggregate MIS data** with GoAP (and DIKSHA/ APEKX) on **ongoing basis** and upon request to promote monitoring, evaluation, and learning in the ecosystem and promote better uptake of PAL in the scale-up. Disseminate periodic reports on process and student learning to school stakeholders and PMU

*B. Roles and Responsibilities of GoAP and Partners (not exhaustive)*

1. Identification of schools for deployment of PAL through school readiness survey and notification to the schools
2. Onboarding of PMU to coordinate implementation of PAL at the state level
3. Approvals for final software copy and PAL curriculum for deployment
4. Deploy and maintain hardware, and resolve all hardware related issues
5. Passing of government orders (G.O.) to Department of Education Machinery at the state, district, block, and cluster, and school level to support effective PAL implementation, including to:
  - a. attend/organise trainings
  - b. ensure timetabling of PAL
  - c. support vendors during installation of hardware and software
  - d. support vendors on necessary data collection
6. Designing monitoring, evaluation and learning (MEL) plan
7. Designing implementation scale-up
8. Fostering learnings from PAL implementation

### Key Performance Indicators for Proof-of-concept and Prototyping Phase (*Indicative*)

PAL vendors will be evaluated based on different indicators for the initial prototyping/ proof-of-concept phase, and the later roll-out/ scale-up phase. **The table below is only indicative of the key performing indicators (KPIs) that will be used for PAL vendor accountability:**

*Set-up and capacity building:*

1. # of total operational devices with PAL software installed and running
2. % Software uptime in PAL class

*Interventions:*

3. % of schools with student onboarding workshops conducted
4. % of total enrolled students in PAL classrooms with unique IDs assigned
5. % of total enrolled students in PAL classrooms receiving a learning gap report
6. % of total enrolled students in PAL classrooms with remedial pathways assigned
7. % of software breakdowns reported by teachers/coordinators

*Coordinators, Headmasters, and Teachers:*

8. % of headmasters who want PAL programming in the next academic cycle

9. % of headmasters who report being satisfied with the support received from PAL vendor through the year
10. % of teachers who report greater awareness of student learning gaps because of PAL
11. % of teachers who report finding PAL effective in remedying students
12. % of teachers who want PAL programming in the next academic cycle
13. % of teachers who report being satisfied with the support received from PAL vendor through the year

*Students:*

14. % of students who report finding PAL curriculum easy-to-follow
15. % of students who report enjoying learning through PAL
16. % of students who report wanting PAL lessons in the next academic year

### III. Eligibility Criteria

To be considered for participation in the proof-of-concept and prototyping phase, the PAL vendor must meet the eligibility criteria below:

*A. Organization Size and Reputation*

- Vendor has cumulative turnover and/or funding received for last 3 financial years of
  - **At least 5 crores for PAL**
  - **At least 10 crores total**
- Vendor can provide two references from school administrators
- Vendor can provide a copy of a work order from a Government body (state or central) for prior experience in government schools

*B. PAL Solution*

- Solution must have features of both personalized and adaptive learning (as defined in Terms of Reference)
- Vendor must be willing and able to create Telugu content and assessments for scale-up

*C. PAL Implementation Experience*

- Vendor must have implemented PAL in **100 schools total**
- Vendor must have implemented PAL in **50 government schools in India**
- Vendor must have experience working with third party systems integrators and/or hardware providers (i.e. hardware not provided by the PAL vendor but by a different party)

*D. Others*

- Vendor must not be blacklisted by any government departments, undertakings and agencies in India
- Vendor must demonstrate an understanding of the objectives of the assignment, as evidenced through Presentation to GoAP

## IV. Evaluation Criteria for Identifying Vendors for Scale-Up

During the proof-of-concept and prototyping phase, the following evaluation criteria will be used to determine which vendors shall be empanelled for the scale-up in AY 2019-20:

### A. Organization, Team and Reputation

- Cumulative turnover/ funding for last 3 financial years of
  - **At least 5 crores for PAL**
  - **At least 10 crores total**
- Qualified team of professionals trained in PAL functions such as developing assessments, multi-media content, and adaptive learning algorithms
- Two references from school administrators
- Work order from Government of India for prior experience in schools

### B. PAL Solution

- Solution must have features of both personalized and adaptive learning (as defined in Terms of Reference)
- Learning algorithms must accurately diagnose actual learning levels of students, and build missing competencies through individual remediation paths
- Action plan for developing assessments and content for other subjects in Telugu, and developing assessments and content for teaching Telugu as a language by **December 31<sup>st</sup>, 2018**
- **SCERT approved curriculum-linked assessments and content** for English, Mathematics, and Telugu for classes 6 to 10
- Solution has **engaging user experience**, as measured by perception surveys and features, e.g. gamification, multi-media content, voice-overs, navigation etc.
- **Breadth and depth of dashboards available** – student baseline, concept wise student percentile, student learning gaps, student progress report, class-wise comprehensive report, monthly student progress report, etc. (Note that few dashboards like teacher, student and admin are mandatory)

### C. PAL Implementation Experience

- Coverage of schools
  - Must have implemented PAL in **100 schools total**
  - Must have implemented PAL in **50 government schools in India**
- **Training approach and execution plan** (for teachers, administrators, coordinators, and field management services staff) submitted
- **Rigor and quality of implementation support** e.g. timetabling support, ticket managements/ grievance redressal system
- **Improvement in KPIs** such as access to PAL platform, usage of PAL platform, remediation dosage, and student and teacher satisfaction

## V. Application Format to be filled in by Vendor

### Application Format for Personalized Adaptive Learning (PAL) Expression of Interest

\*\*\* For all the questions below, please provide proof wherever possible to further strengthen the application \*\*\*

#### A. Organization's Profile

1. What is the name of your organization?
2. What is the name of your PAL platform?
3. Which year was your organization incorporated/ set-up?
4. What is the address of your organization (including branch offices)?
5. Please provide the contact person's
  - a. Name and Designation:
  - b. Contact Number:
  - c. Email Address:
6. What is the total number of schools the PAL solution is deployed in?

# of Schools	Andhra Pradesh	Other States in India	Outside India
Government schools			
Low-cost private schools			
Others			
<b>Total</b>			

7. What is the total number of active users (number of students who have used software **at least 5 times in last 30 days**)? *If you would like to provide numbers for a different definition of active users, please provide that definition*

# of Active Users	Andhra Pradesh	Other States in India	Outside India
Government schools			
Low-cost private schools			
Others			
<b>Total</b>			

B. PAL Platform Details (please provide written descriptions / other illustrations to support the points below; please attached any supporting documents as required)

#### Software Functioning

8. Please provide a description of how your learning platform works, and why it is both "personalized" and "adaptive"

9. Please tell us about the level of adaptability of your software. For example, if the platform is teaching and assessing a class 6 subject, how many classes back does the content go?
10. How does your learning platform provide remediation for each student's competency deficiencies?
11. What is the breadth and depth of your learning platform's dashboard and progress reports? (e.g. module-wise, student-wise, and class-wise reports; real-time and cumulative reports). Please provide details for dashboards/ progress reports covering students, teachers, and administrators, if available.
12. How do you operate your ticket management system to resolve software and pedagogical queries?
13. Does your software collect data related to *device* performance (e.g. hours powered on, battery level, etc.)? If yes, please provide details of the data you collect.

#### *Technical Details*

14. Can your learning platform be used offline, and sync a considerable amount of content when there is low internet speed?
15. Does your solution work on tablets, laptops, or both?
16. What are your hardware requirements for PAL? (Please specify for each category)

<b>Category</b>	<b>Recommended Configuration</b>
<i>Server</i>	
<i>Devices (laptops/ tablets)</i>	
<i>Access Point</i>	
<i>Monitor</i>	
<i>UPS</i>	
<i>Patch Cord</i>	
<i>Keyboard</i>	
<i>Mouse</i>	
<i>Voice Splitter</i>	
<i>Headphones</i>	
<i>Others</i>	

17. What is your preferred ratio of students to device for your learning platform to operate optimally? Is it possible for two students (paired at the same level) to be logged-into one device?
18. What safeguards do you have to protect the privacy of student assessment data?

*Subjects, Grades and Outcomes*

19. Which subjects, and grades does your PAL platform have content and assessments developed for? Please also indicate if content and assessments for other regional languages has been adopted (Please tick all that apply)

<b>Subject</b>	<b>Class</b>									
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<i>Maths</i>										
<i>English</i>										
<i>Hindi</i>										
<i>Others (please specify)</i>										
<i>Others (please specify)</i>										
<i>Others (please specify)</i>										

20. Please provide details of any evidence you have collected (directly or by a third party) indicating improvements in learning outcomes generated by your solution for
- Government schools:
  - Low-cost private schools:
  - Others:

*C. Experience Details*

21. Please provide at least 2 references from administrators of a government or low-cost private school, and a copy of a work order from a state or central government body
22. How many years has your organization operated its PAL platform for?
- Andhra Pradesh:
  - Other States in India:
  - Outside India:
23. What is the size of your team, and the qualifications of professionals within the education domain on your organization's payroll?
24. Please tell us about your experience in deploying PAL in government and low-cost schools in rural areas with limited power supply, low internet connectivity, and poor road access
25. Please tell us about your experience working with third party systems integrators and/or hardware providers
26. Please tell us about your experience linking the content and assessments of your PAL platform to fit the numeracy and literacy curriculums of various state boards

27. Please tell us about your experience in making the content and assessments (including script and audio) in conversational English and other languages
28. How long will it take to adapt the platform to produce assessment and content in Telugu, and develop a program to test mastery of the Telugu language? How much is this estimated to cost?
29. Please tell us more about your experience in sensitizing, on-boarding, and training administrators and teachers for use of PAL solution. What has been your success in guiding teaching personnel to understand and use the platform continuously?
30. Please tell us about your experience in providing timetabling support, troubleshooting and on-demand query resolution, and ensuring continuous usage of the platform

#### *E. Financial Details*

31. What is the annual revenue and/or other funding of your organization from FY16 to FY18? How is this revenue/ funding broken down by the PAL platform versus other products?
32. For the *PAL platform*, how is the revenue/ funding of your organization from FY16 to FY18 broken down for:
- Government schools
  - Low-cost private schools
  - Others
33. Keeping in mind the school profiles provided in the ToR, please provide an **estimation of per school annual price-break down** (e.g. software, content, teacher training and field management services; exclusive of hardware and system integration costs) for:

**First year of deployment (academic year 2019-20):**

<b>Per School Price Breakdown</b>	<b>Deployment in 0-100 schools</b>	<b>100-300 schools</b>	<b>300-500 schools</b>	<b>500-1000 schools</b>	<b>Over 1000 schools</b>
<i>English, Mathematics and Telugu</i>					
<i>Other Subjects</i>					

**Subsequent years of deployment (beyond academic year 2019-20):**

<b>Per School Price Breakdown</b>	<b>Deployment in 0-100 schools</b>	<b>100-300 schools</b>	<b>300-500 schools</b>	<b>500-1000 schools</b>	<b>Over 1000 schools</b>
<i>English, Mathematics and Telugu</i>					
<i>Other Subjects</i>					