

Slate2Learn Dashboard project

Background information

Slate2Learn runs a microfranchise of low-cost digital learning centres in Delhi, for after-school tuitions. Each centre is located in the tutors' home and equipped with 10 android tablets and a raspberry pi server. Children come once a day to learn for 40 mn on a tablet, using Slate2Learn adaptive learning programme.

We offer English language courses for class 1 and 2 at present.

Each centre can cater to up to 100 children.

We have 3 centres running in southern suburbs of Delhi since January 2017.

Data generated in the centres is sent once a day to our cloud database, with the goal of monitoring centres remotely.

Technical details

Current stack for the cloud platform: Heroku django app + REST framework api, postgres database.

Objective

To create a dashboard that allows visualization in real time of data generated in Slate2Learn learning centres.

Slate2Learn wants to use the data collected in the centres to identify problems with centres, and even their causes, in order to solve them quickly but also single out centres that perform very well to identify and replicate best-practices.

There are 3 sets of metrics that we need to monitor: business data, admin/management data, and learning data.

The frontend technology used to create the dashboard is at the discretion of the team. Centre data will be provided to teams in JSON format, or CSV. There is a possibility for teams with a prior knowledge of Django to work on the backend of the API.

Business data

How are the microfranchise businesses performing individually and comparatively?

Simple metrics

- Monthly centre income: sum of all money received by the tutor in a month
- Customer acquisition rate (number of new children this month)
- Attrition rate (number of children who came last month but who didn't come this month)

- Conversion rate: percentage of children registered that end up buying credits

More advanced metrics

- Reason for dropping out (eg: low results, not enough content)
- Average amount of money received by 'active child' per month (need to define active child)

Administrative data

Are the learning centres well managed?

This data is used by Slate2Learn managers to make sure tutors are following Slate2Learn's rules (for instance: are children on a device for at least 30 mn, 6 days a week?).

Primary metrics

- Average session length
- Average number of days children come per week (when centre is open).
- Number of days where the centre was closed.

Secondary metrics

- Number of days in a row without backup of data
- Average number of minutes the centre is open during the day

Learning data

Are children learning well in the centre? Data should be available at centre level, and at learner level.

This platform will also be used to identify problems with the content, and to improve upon the curriculum.

Learning metrics

- Number of new knowledge components seen per session per child.
- Variation in knowledge probability over all knowledge components per month per child. (need to define a relevant indicator for this)

Content related metrics

- Simple: Average score per question (content metrics): identify problems with individual content items.
- For those who want to dive more deeply into data analytics, visualization of children's progression on the knowledge map can be considered. More details on our adaptive learning algorithm can be provided upon request.

Dataset description

Learners

Profile info: date of birth, gender, parents occupation, etc..

Transactions

Data about credits bought by parents and spent by learners. 1 credit is spent per learning session. Credits can be bought by bundle of 12 or 24.

Example:

learner_id	timestamp	amount	credits
10000038	17-03-10 14:25	250	24
10000038	17-03-10 14:40	0	-1

Credits bought

Credit spent

Experiences

Recorded interaction between a learner and a question.

learner_id	question_id	answer	score	start_time	reording_time	latency
10000038	674	'kat'	0	17-03-10 14:40	17-03-10 14:40	13489

Knowledge Map

The curriculum is split into micro 'learning objectives' that we call knowledge components.

After each new interaction of a child with the learning material, the adaptive learning programme computes and updates the probability for this child of knowing each of the learning component that came into play during the interaction.

The knowledge probability over the entire curriculum is called the knowledge map of a child.

Knowledge map table:

learner_id	Knowledge component id	Knowledge probability	last_seen
10000038	709	0.45	17-03-10 14:40