GOORU

LEARNING NAVIGATOR - a "GPS for Learning"

With an interoperable framework for competency, learner profile and recommendations

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Education is a Human Right

Learning Navigator - a "GPS for Learning"

Honor the Human Right to Education

Dr. Prasad "Pram" Ram

- Founder, Gooru.org, researched and developed learning navigation technology - patent pending.
- Director of Research at Google, led projects on Maps, News, Books, Translation, Search and Ads.; Engineering leader at Yahoo!, Research Scientist at Xerox PARC.
- Ph.D. Computer Science, UCLA, B.Tech. Computer Science, IIT-Bombay (1987).

Learning Navigator

- Prototyped at Google by Pram and founded in Silicon Valley to bring "Google Maps for Learning".
- Informed by practice and backed by science, developed technology, prototypes and implemented in programs in US schools.
- Developed the Learning Navigator and using that to bring math proficiency within 3 years for everyone.

Education focuses on **destination**, i.e., what the student should learn with courses, standards, and assessments

BUT

Education lacks detailed data on student's **location**, i.e., knowledge, skills and dispositions

High-rates of high-school and college dropouts

1.2M
Students drop out of high-school every year (25%)

31%
Students dropout of college

Students perform poorly in Math in High-school and College

9th Grade
7th-8th Grade
5th-6th Grade

3rd-4th Grade
1st-2nd Grade

80% of high school freshman below grade level in urban schools

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To Navigate a learner, first Locate them, then
## Curate activities, Facilitate practices and Mediate pathways

Current Proficiency
Competency Based Lesson
Destination

Learning Pathways

MEDIATE PATHWAYS

Competencies
Monitor Progress
Personalize Suggestions
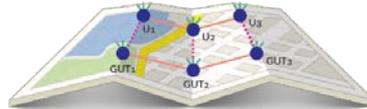
Classroom Practices

FACILITATE PRACTICES

Courses
Collections
Assessments
Resources

Learning Activities

CURATE ACTIVITIES

Mastery
Effort
Performance

Learner Profiles

LOCATE LEARNER

Navigator - Student Experience

"You have arrived at your destination"
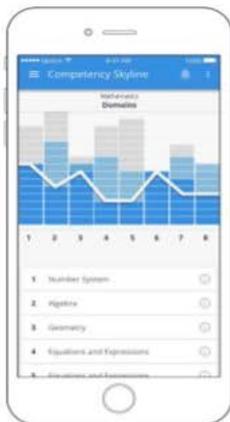
Student's knowledge, skills and mindsets are located with precision

Students obtain a learning route based on their profile

Study using Navigate Math content that spans grades 2-8

Receive reroute suggestions based on performance

Review progress by inspecting their learning path

Learning route based on profile and reroute based on performance

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Navigator - Educator Experience
Monitor Students, Personalize Instructions and Professionally Develop
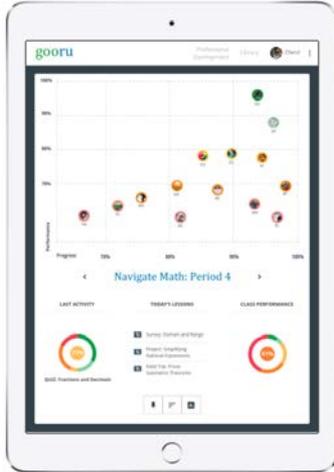
Teacher monitor their students progress and performance and can personalize their interventions

Teacher receive suggestions for students based on curriculum and non-cognitive skills performance
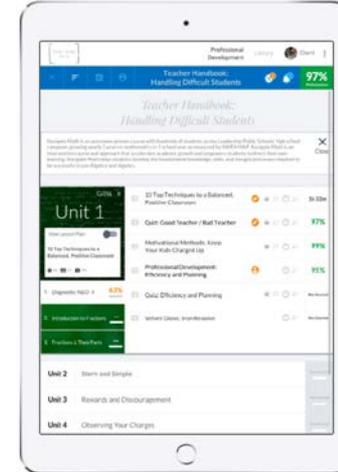
Teachers receive suggestions for their own professional development informed by their class performance

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For past 3 years, high-school students using a research prototype of the Navigator called "Navigate Math" achieved 2.8 years of growth in one year

LEADERSHIP PUBLIC SCHOOLS

82% Low-income

83% First in family to go to college
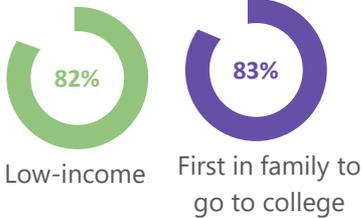
80% of incoming freshman enter with math skills below 9th grade.

9th Grade
7th-8th Grade
5th-6th Grade
3rd-4th Grade
1st-2nd Grade

Christensen Institute Report, July 2016

URBAN EDUCATION
- Pre-algebra & student agency
- Avg of 2.8 years of growth per year measured by NWEA MAP
- Taught across 3 schools by teachers ranging from first year to veterans

2.8 years of growth in one year

The above results are not from navigator for math, but, from a research prototype called navigate math which also included extensive classroom practices and non-cognitive skills development.

Learning Navigator: Study - Teach - Build

**Students study with performance based Suggestions**

Navigator suggests a learning route based on student profile & reroutes based on performance

Educators build other Navigator courses

LEARNING NAVIGATOR

Teachers personalize using real-time data

Educators curate 4.4M open rich-media resources into competency-based courses complete with assessments

Teachers use real-time data from student performance to personalize instruction

Navigator Informed by Practice and Backed by Science
Board of Directors and Advisors

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Provisional Patent for Learning Navigation Technology
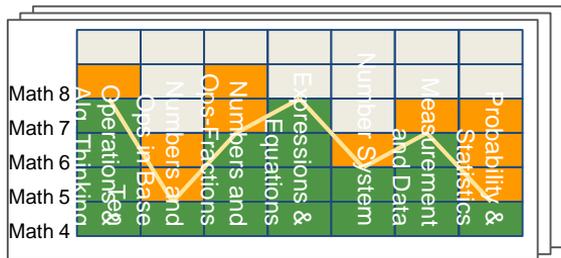
LOCATE
"Skyline" / subject locates mastery in concepts and also track Progress, Portfolio and Preferences
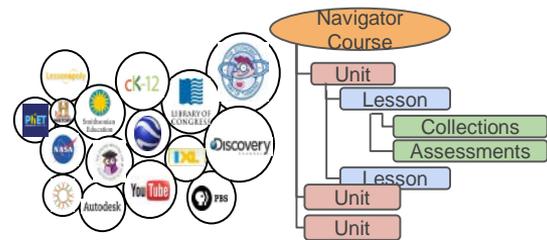

CURATE
5M Learning Activities with Questions, 20,000 Collections & Assessments

NWEA MAP
Christensen Institute

FACILITATE
Teachers can monitor, engage in live assessment and personalize instructions
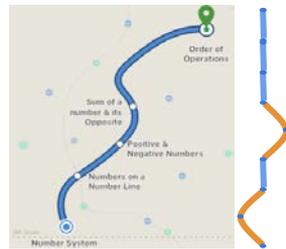
MEDIATE
Suggest route based on profile and reroute based on performance

Competency Graph with Dependencies
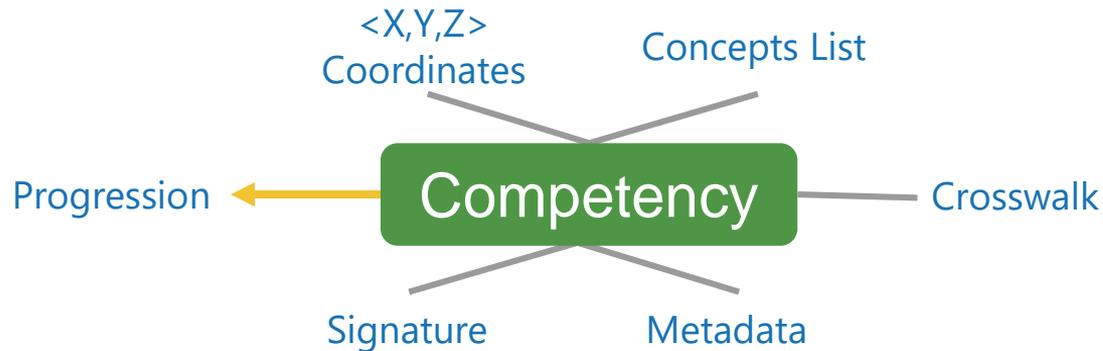
X-Y-Z Coordinates
- *Subject-Level-Domain values*

Concept Lists
- *Concepts have a list of potential mis-concepts*

Crosswalk
- *Across all standards framework*

Metadata
- *Title & Description*
- *2-word display*

Signature Content
- *Collections to learn*
- *Assessments for badges*

Progression
- *Pre-requisites*
- *Cross-subject*

"Latitude-Longitude for Learning"
Extend or Refine the Learning Space in any area of Learning

Metric space

- Z-axis for Subject
  - ○ Core curriculum
  - ○ Non-cognitive skills
  - ○ Skills Training
- Y-Axis for Learning Depth
  - ○ Competencies span domains
- X-Axis for Domains
  - ○ Domains of concepts
  - ○ Domains span courses
- XY-Plane for competencies
  - ○ X-Y points are Concepts
  - ○ Concepts grouped into Competencies
- Skyline
  - ○ Line connecting the highest competency

LEVELS

Math 8
Math 7
Math 6
Math 5
Math 4

Operations & Alg. Thinking
Numbers and Ops in Base Ten
Numbers and Ops-Fractions
Expressions & Equations
Number System
Measurement and Data
Probability & Statistics

SUBJECTS

DOMAINS

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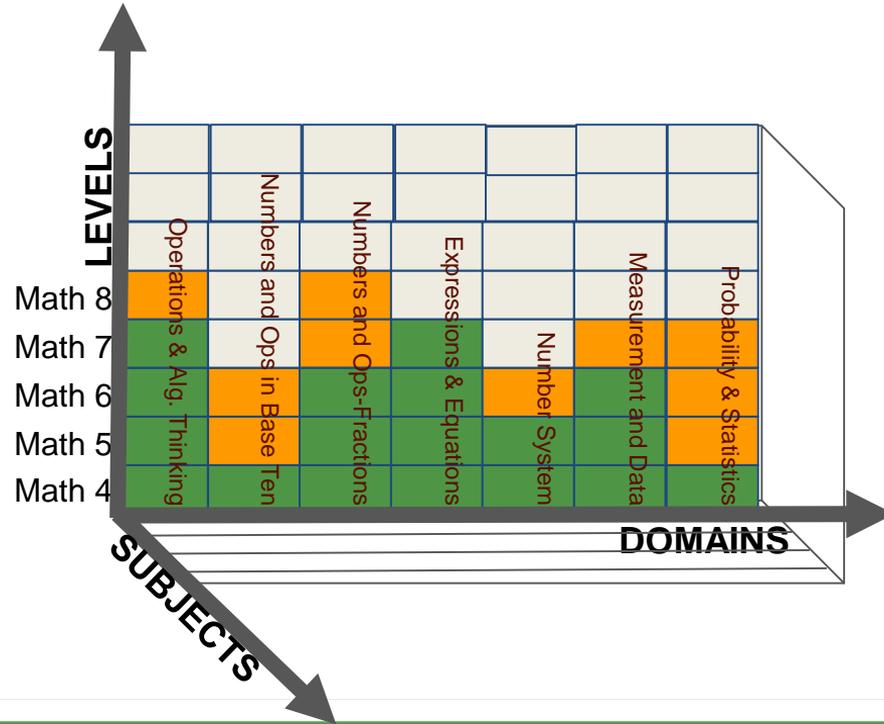
"Locate the Learner"
Real time updates of the learner's mastery in competencies
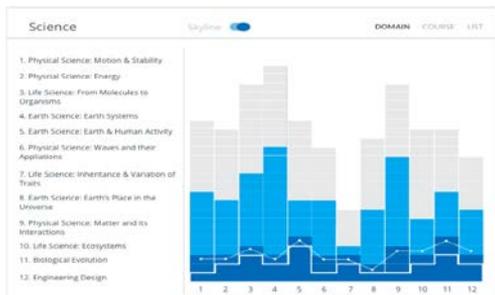
1 Year Ago
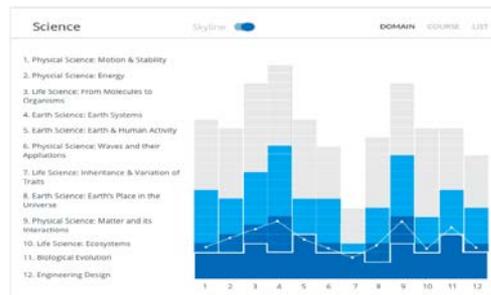
6 Months Ago
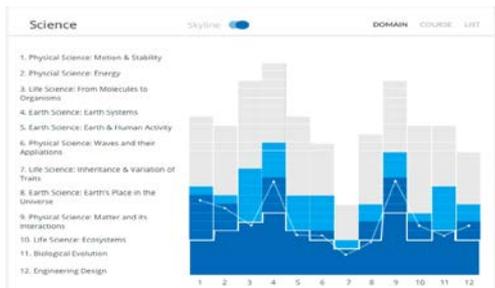
1 Month Ago

1 Week Ago

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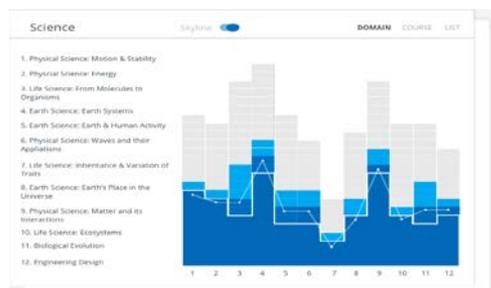
Develop Navigator Courses
Tagged to competencies and complete with assessments

Navigator Course

Framework defines metadata structure for every level - Course, Unit, Lesson, Collection, Assessment, Resources and Questions

Unit

Learning Objectives
Essential Questions

Collections include resource types like Interactives, videos, web pages, images, audio, pdf and 9 question types

Lesson

Collections — Playlist of resources

Aligned to competencies, micro-competencies

Assessments — Playlist of questions

Aligned to competencies, concepts, level of rigor

Lesson

8 machine-scorable item types
Free response items with rubric scoring

Unit

Unit

# Facilitate Classroom Practices with
Monitoring and Live Assessments

Students achieve academic success and develop non-cognitive skills with support from teachers and peers

The Learning Navigator
(click to watch the video)

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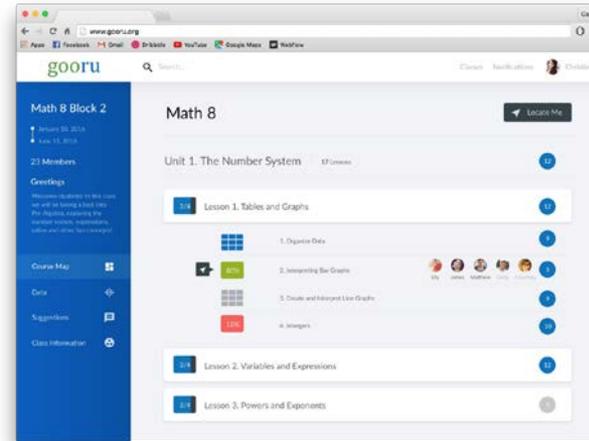
Mediate Personalized Pathways

Route Based on Profile

- Learner Profile = Progress + Performance + Proficiency + Portfolio + Preference

- Reroute reinforces a competency when a student underperforms

- Students earn a badge for a competency against a "signature assessment".

Reroute based on Performance
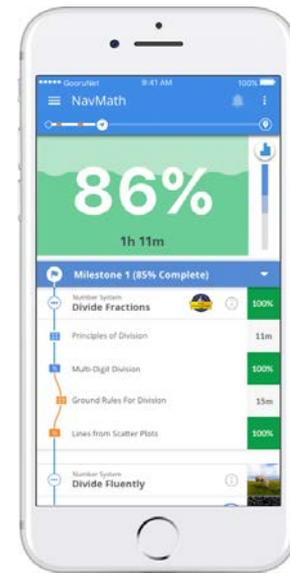
THANK YOU

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Research Funders

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