



AI-Assistants in Education

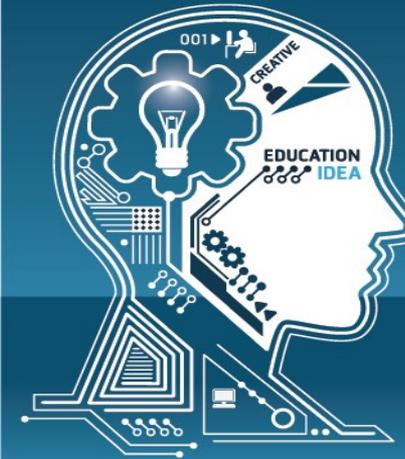
Alina A. von Davier

ACTNext by ACT

Next Generation Digital Learning Environment

(Educause, 2015)

- 5 domains of core functionality:
- **Interoperability and Integration**
- Personalization
- **Analytics, Advising, and Learning Assessment**
- Collaboration
- Accessibility and Universal Design
-
- *“Weaving together of standard formative assessments, adaptive learning technology, and learning analytics”*



**Envision
the Future
of Learning**

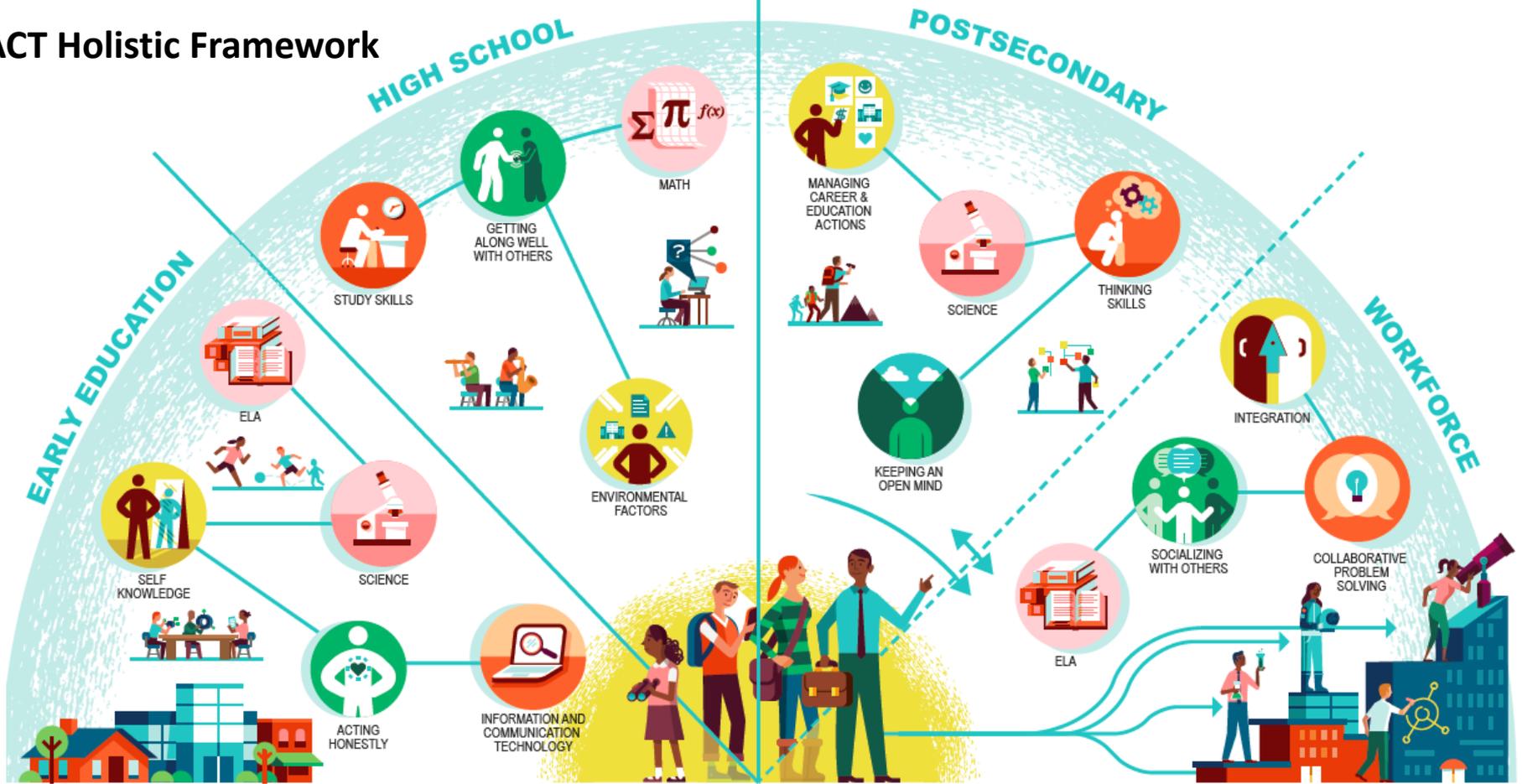
ELI Online Focus Session
*Exploring the
Next-Generation Digital
Learning Environment:
Opportunities and Challenge*
April 27–28

Join us April 27–28 for the ELI Online Focus Session, *Exploring the Next-Generation Digital Learning Environment: Opportunities and Challenges*, to see how this learner-centered approach to higher education can be realized through innovation and creativity.

EDUCAUSE LEARNING INITIATIVE

EDUCAUSE

ACT Holistic Framework



CORE ACADEMIC SKILLS

CROSS-CUTTING CAPABILITIES

BEHAVIORAL SKILLS

EDUCATION & CAREER NAVIGATION

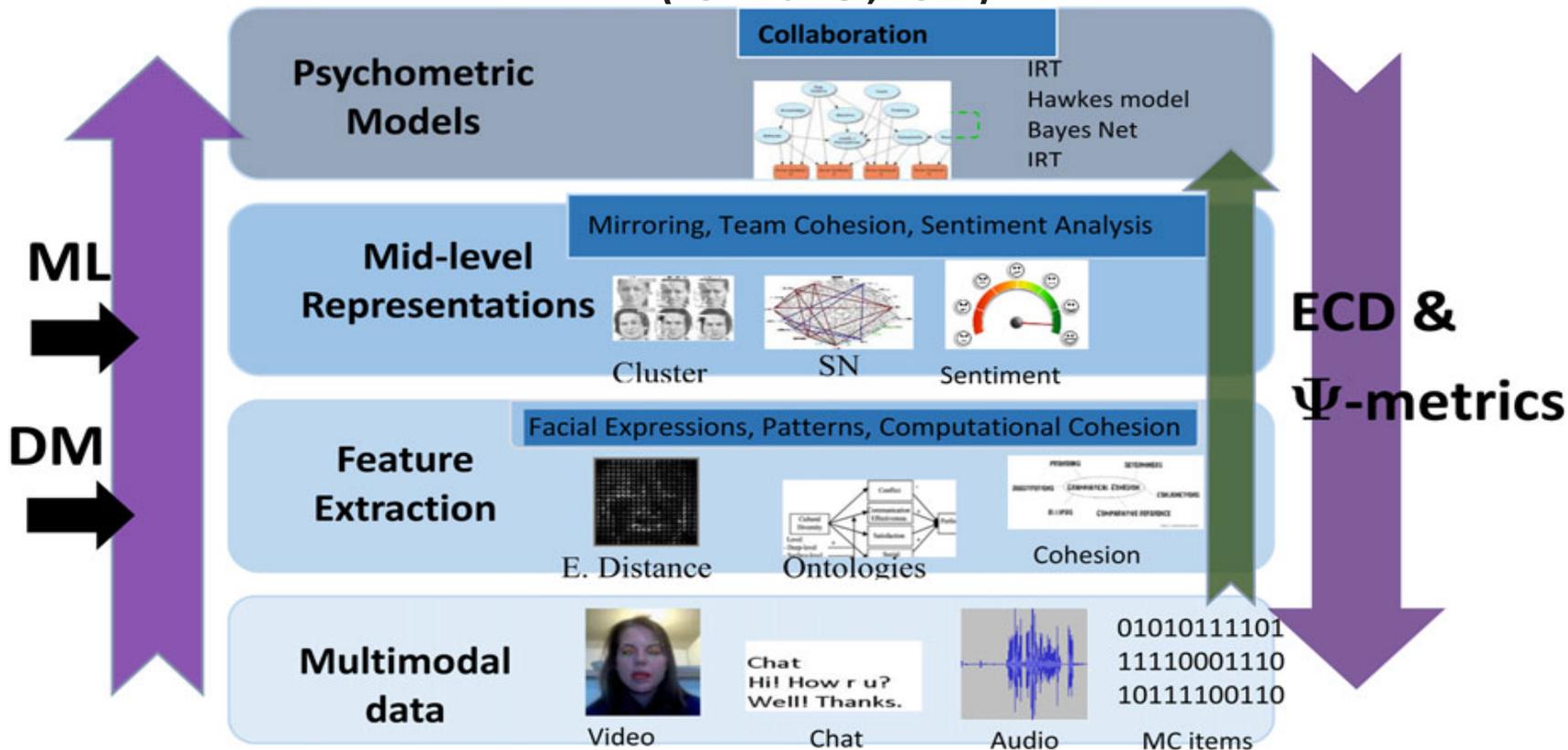
In the future, learning and assessment are modeled by a blend of theory- & data-driven algorithms

“The future is already here - it’s just not very evenly distributed” (William Gibson)

Computational Psychometrics.

A model for performance and collaborative assessments

(von Davier, 2017)





The Robots Are Coming to School!

ACTNext: Companion App

Text to Speech, Translation, Internationalization

ACTNext Companion App

- Research-based Prototype
- Piloted September—December, 2017
- Modular Capabilities to be deployed in various products
- The Recommender and Diagnostic (RAD) engine has been operational in the ACT Academy since September 2018

New:

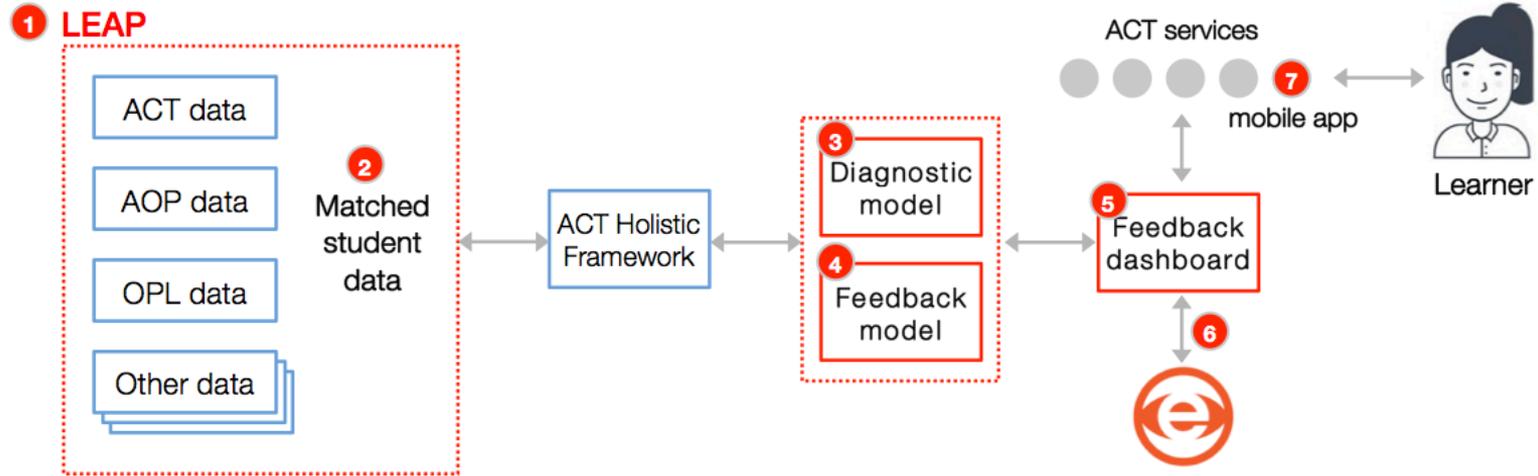
- Text to Speech, Translation, Internationalization
- ACT Amazon Alexa Skill: Voice-based coach

Foray into Personalized Learning



- **Research:**
 - Model learning over time, with hints
 - Develop a new type of cognitive diagnostic model that is appropriate for learning
 - Expand the ECD
- **AI/Multimodal Analytics:**
 - Fuses different types of student data together
 - Generate items, tasks, and scaffolding
 - Align testing instruments & instructional resources via taxonomies
 - Provides an overall feedback accounting for many data sources & links it to remedial resources (OER:OpenEd)
- **Development:**
 - Personalization through mobile app
 - Delivery through OpenEdx/TAO/SmartSparrow
- **Business Innovation:**
 - Provides capabilities to large-scale products

Missing Link Project





Academic



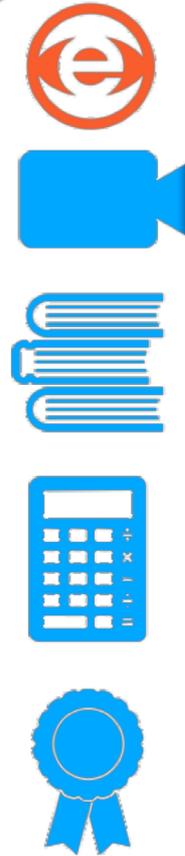
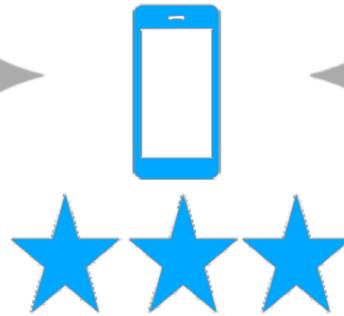
Behavioral



Cross-Cutting

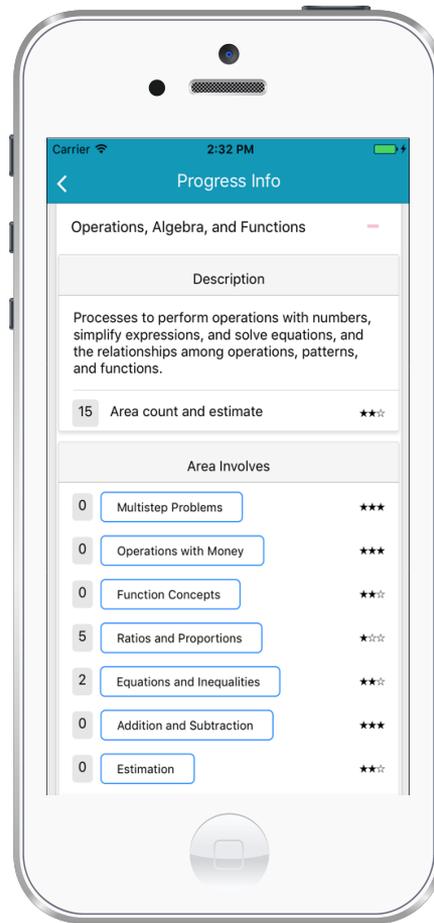
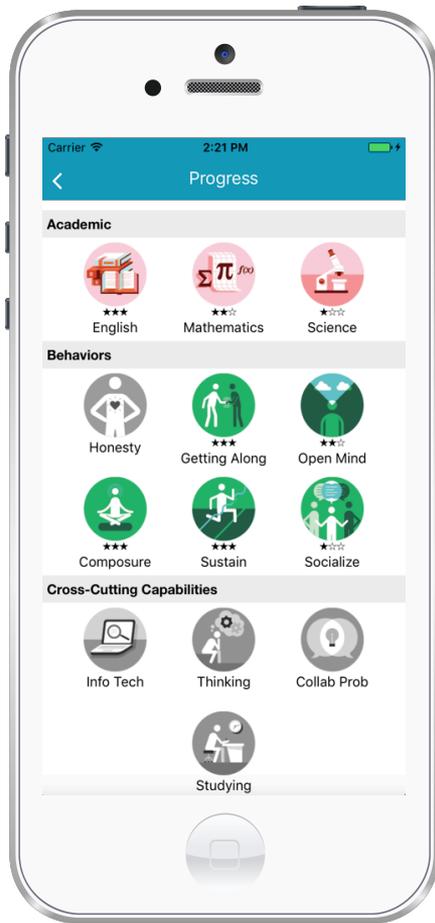


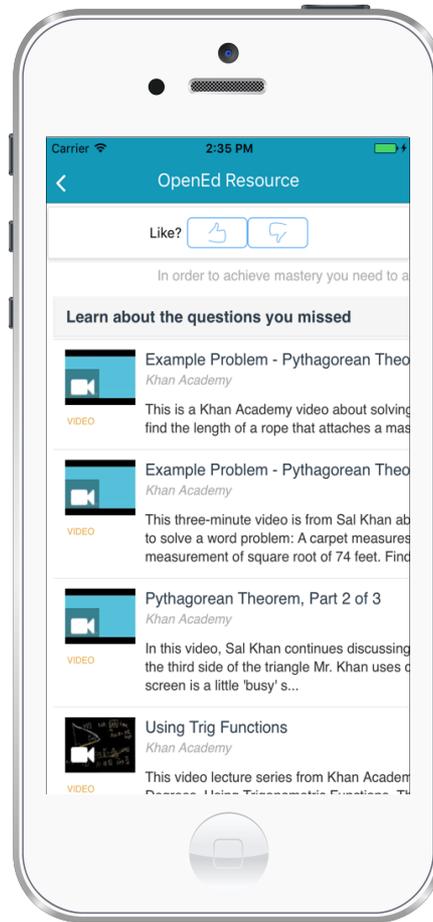
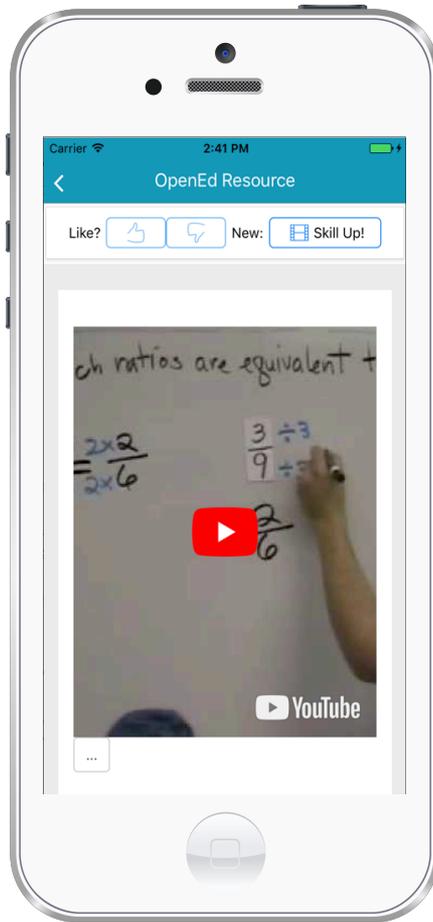
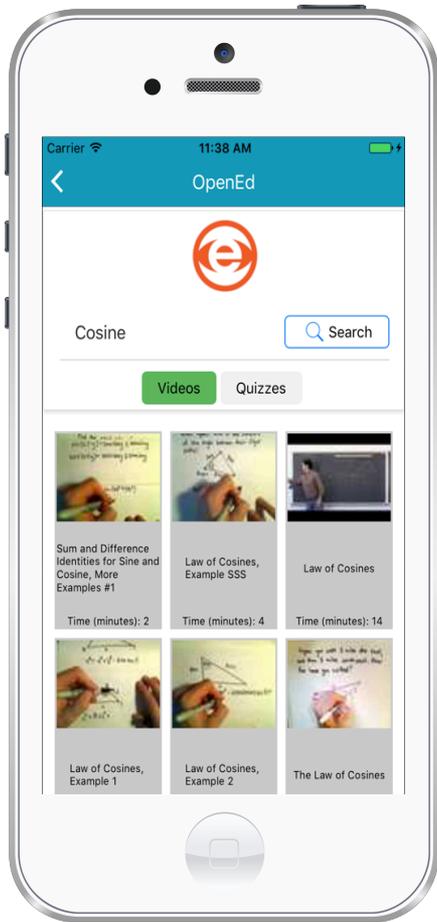
Navigational

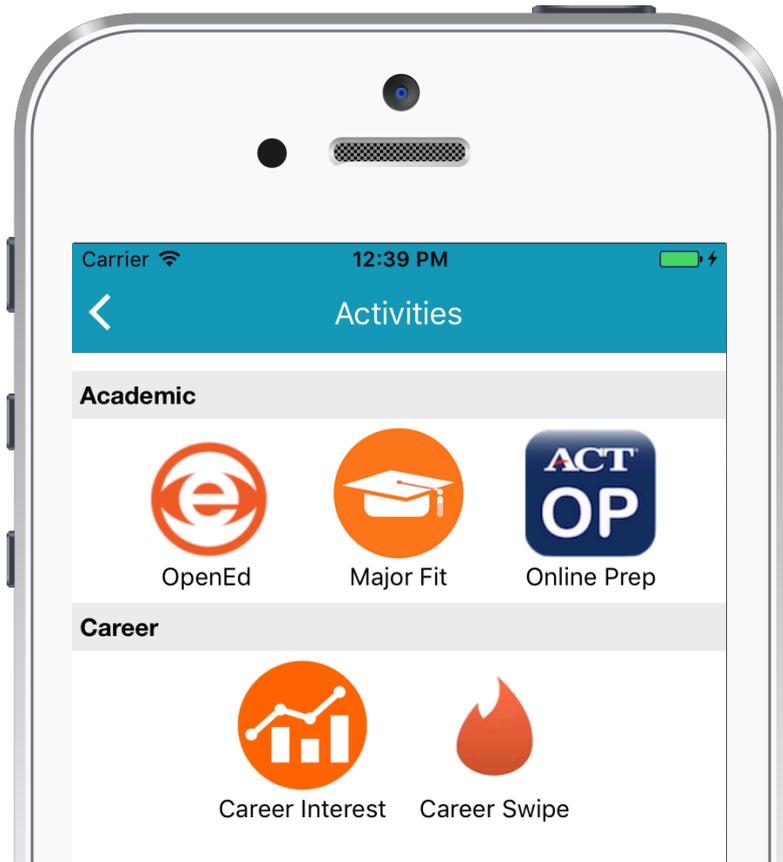


Companion App Overview

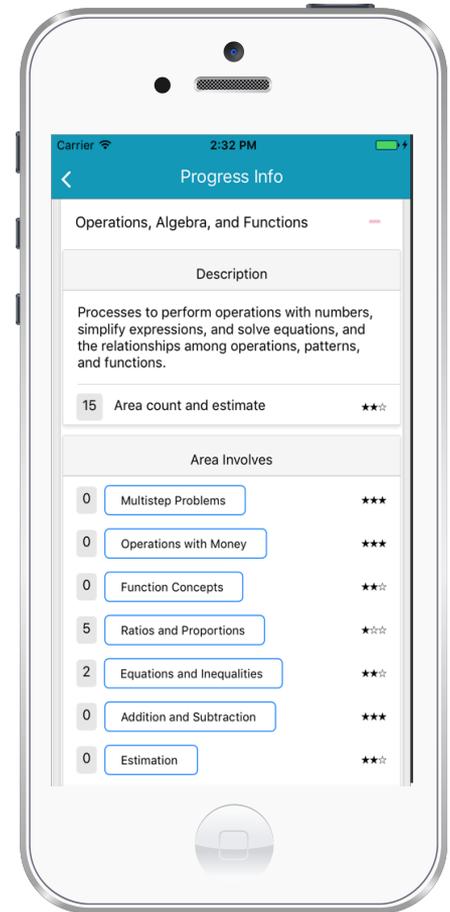
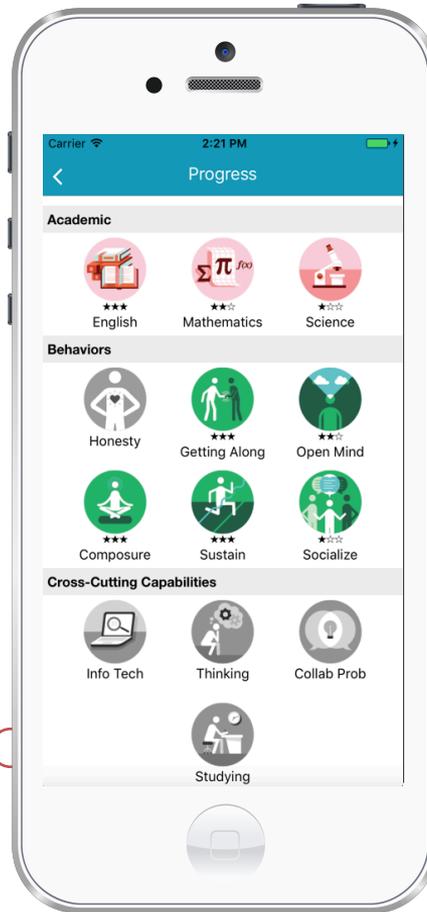
- Short, 2.5 minute overview
 - <https://vimeo.com/310842023>







ACTNext Educational Companion



Companion App Technologies

- App built using React Native <http://www.reactnative.com>
 - Originally developed by Facebook
 - Supports both Apple iOS and Android platforms/stores
 - Back-end services are hosted at Amazon Web Services
 - Resource Bundles are used to support translations of the application to multiple languages

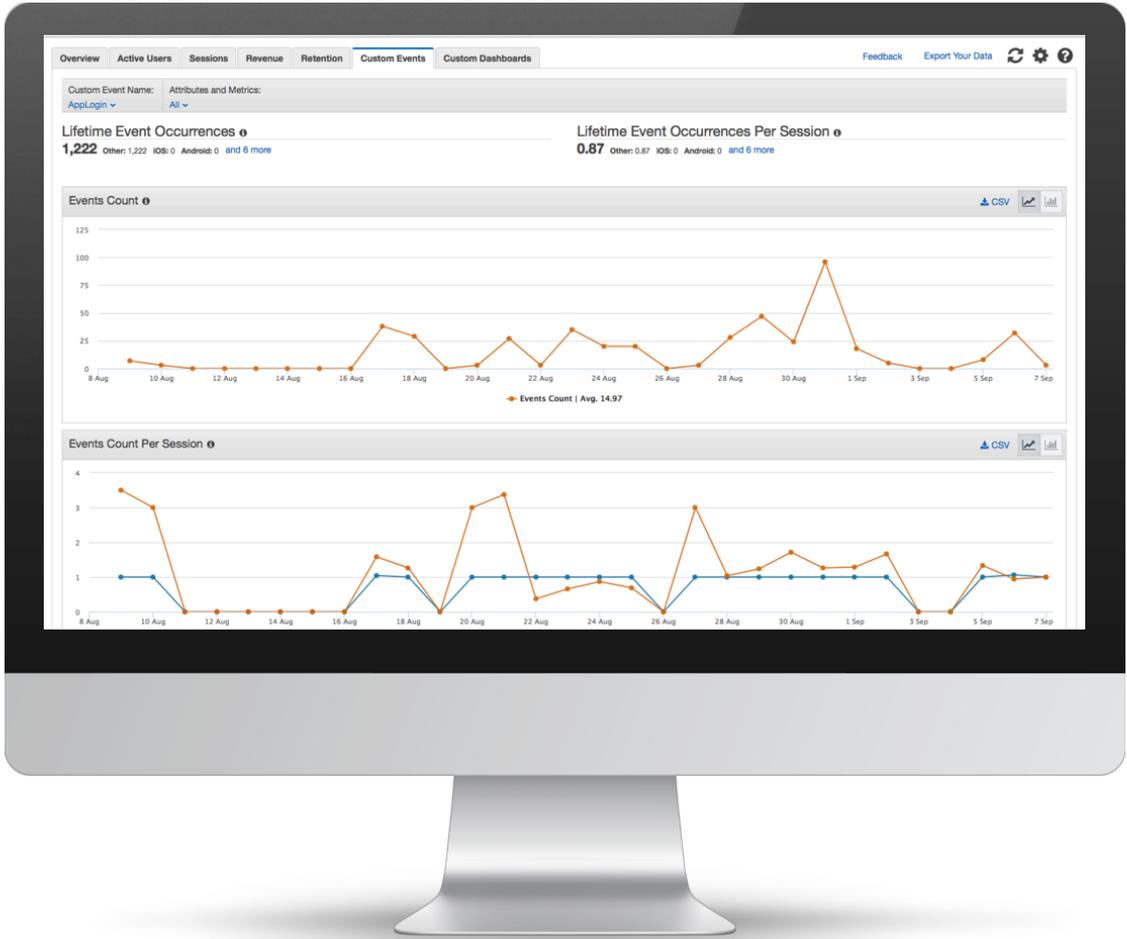
Companion App Speech/Translations

- Short, 2.5 minute overview
 - <https://vimeo.com/310852667>

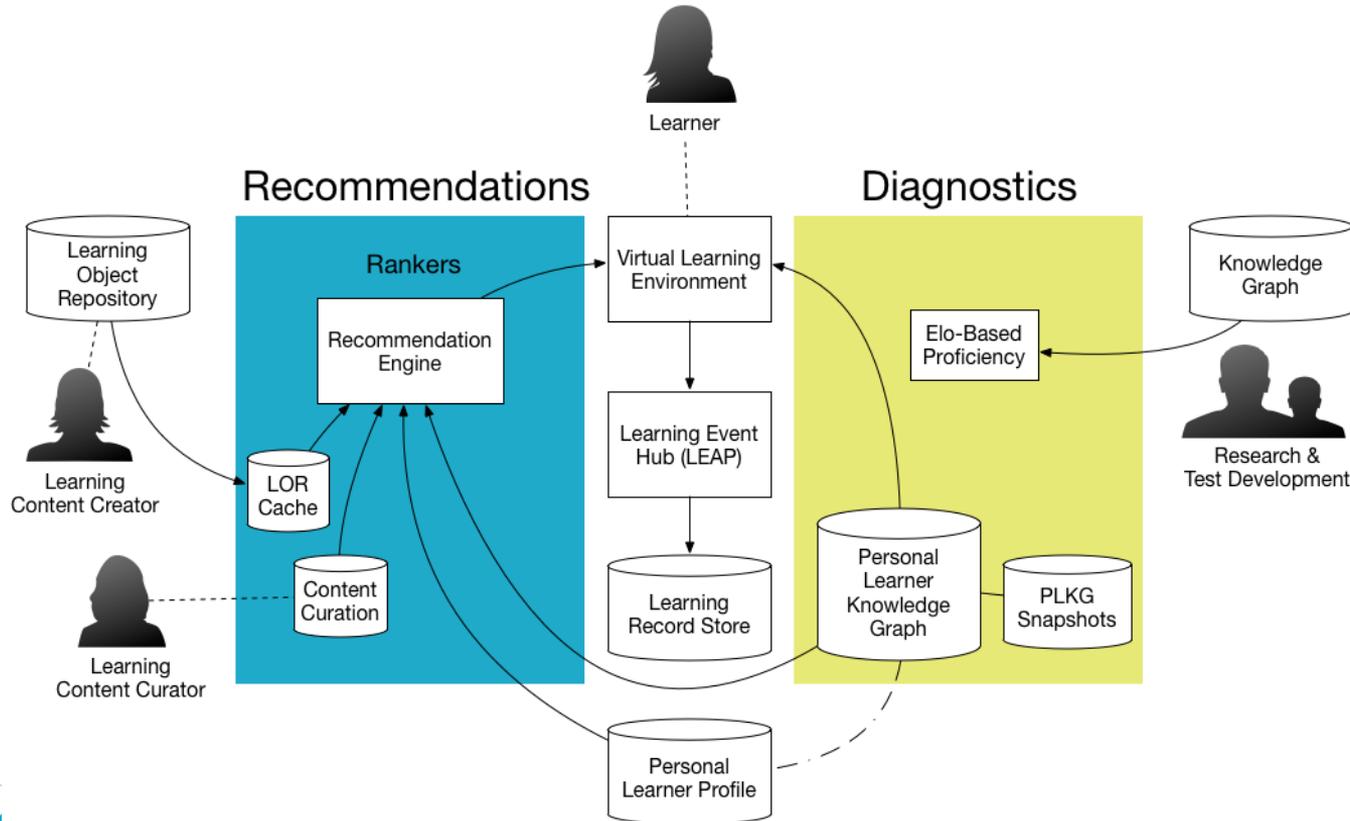
Companion App: Speech/Translation

- Technologies used in language translation
 - Amazon Translate, <https://aws.amazon.com/translate/>
 - Google Translate, <https://translate.google.com>
- Technologies used in converting Text to Speech
 - Amazon Polly, <https://aws.amazon.com/polly/>
 - iSpeech, <https://www.ispeech.org>
- Audio Editing
 - Audacity, <https://sourceforge.net/projects/audacity/>

Learning Analytics & Efficacy



Architecture for Learning and Assessment Systems



Conclusions

- The robots are here to stay!
- With power comes responsibility:
 - Data privacy
 - Ethics
 - Fairness
 - Reliability & validity

- Thank You!

This work has been conducted in collaboration with Steve Polyak, Michael Yudelson, Benjamin Deonovic, , Kurt Peterschmidt

- Q &A
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