Prospects & Expectations for Learning Analytics

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A **Plug & Play** Architecture, Ecosystem and Community
for the Purpose of Advancing Educational Innovation

http://www.imsglobal.org/imsglobal2014annualreport.pdf
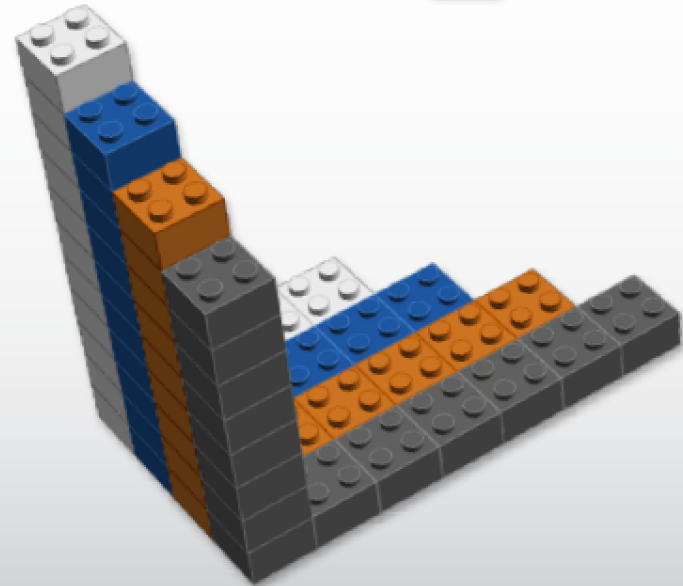
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IMS Scope of Activities

Agenda

1. Brief Overview of Learning Analytics
2. Progress of IMS Caliper Analytics
3. Predictions for Next Year Progress

Agenda

1. **Brief Overview of Learning Analytics**
2. Progress of IMS Caliper Analytics
3. Predictions for Next Year Progress

in figure 1, which is adapted from the book "Analytics at Work" by Davenport et al [1].

Key Questions Positioning		
Past	Present	Future
Information Reports & Description	Alerting	Extrapolation
Insight Models & Explanation	Recommend-ations	Prediction

Figure 1 - Key Questions Matrix from Davenport et al

Source: CETIS: Adam Cooper; A brief history of analytics
http://publications.cetis.ac.uk/wp-content/uploads/2012/12/Analytics-Brief-History-Vol-1-No9.pdf

TABLE 1: LEARNING AND ACADEMIC ANALYTICS

Personalized
Learning
and
Student
Success

Faculty
and
Institutional
Performance

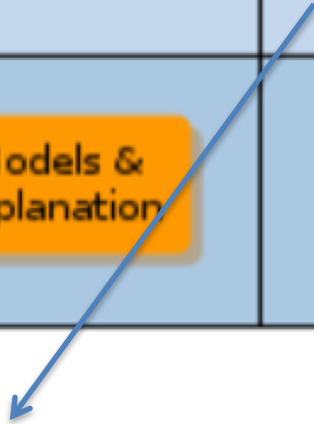| TYPE OF ANALYTICS	LEVEL OR OBJECT OF ANALYSIS		WHO BENEFITS?
Learning Analytics	**Course-level:** social networks, conceptual development, discourse analysis, "intelligent curriculum"		Learners, faculty
	Departmental: predictive modeling, patterns of success/failure		Learners, faculty
Academic Analytics	**Institutional:** learner profiles, performance of academics, knowledge flow		Administrators, funders, marketing
	Regional (state/provincial): comparisons between systems		Funders, administrators
	National and International		National governments, education authorities

Key Questions Positioning

	Past	Present	Future
Information	Reports & Description	Alerting	Extrapolation
Insight	Models & Explanation	Recommend-ations	Prediction

Learning Analytics: Does student appear to be participating and/or understanding a key concept?

Academic Analytics: Is the performance of a cohort of students at historical norms?

TABLE 1: LEARNING AND ACADEMIC ANALYTICS

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	National and International	National governments, education authorities

IMS
Focus

Source: EDUCAUSE
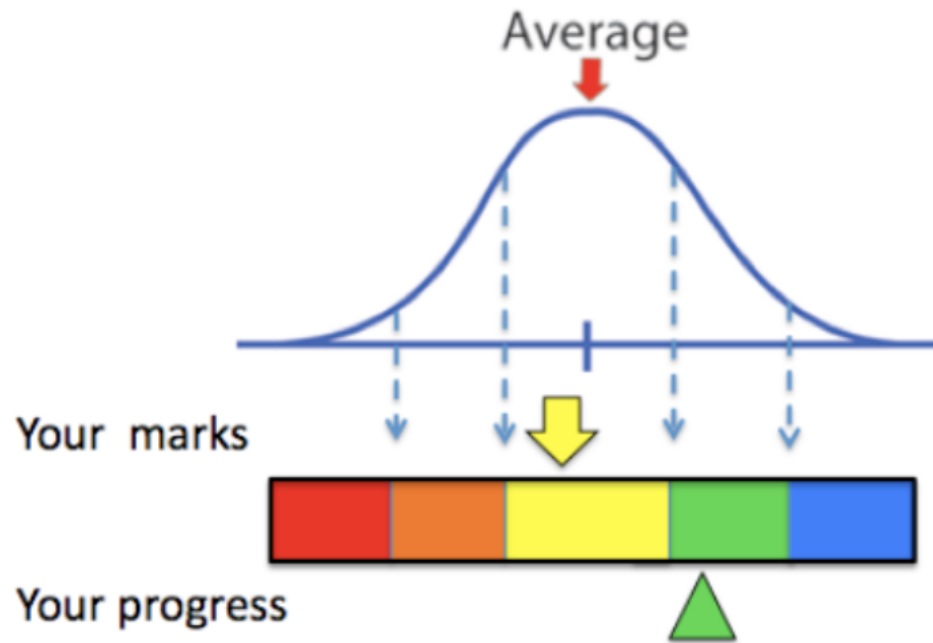www.cdn.educause.edu/visuals/shared/er/ERM1151/ERM1151_table.jpg
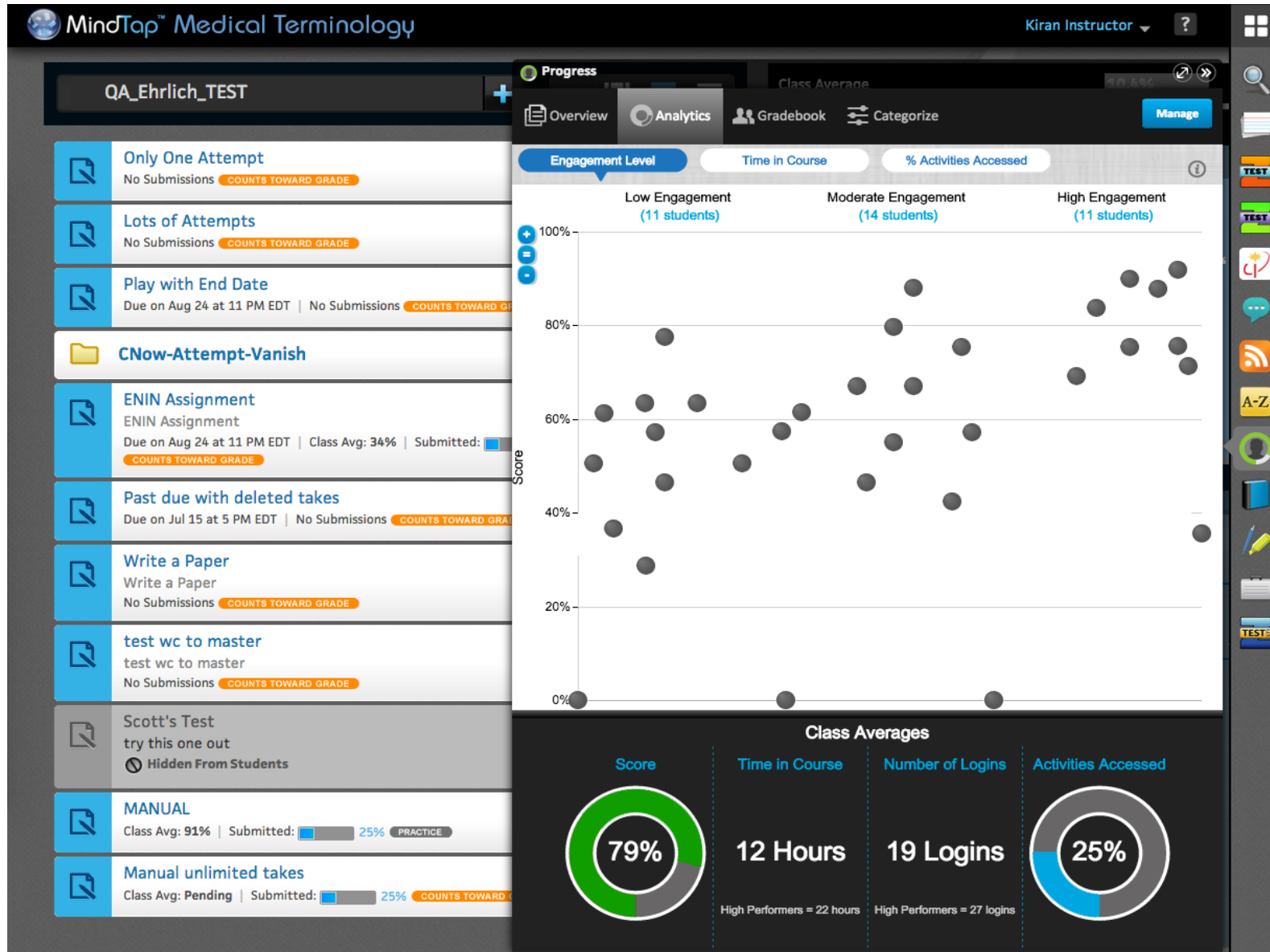
Learning
Analytics
Example #1
for
Faculty:

Use of and
**Engagement
With**
Instructional
Materials

Learning
Analytics
Example #2
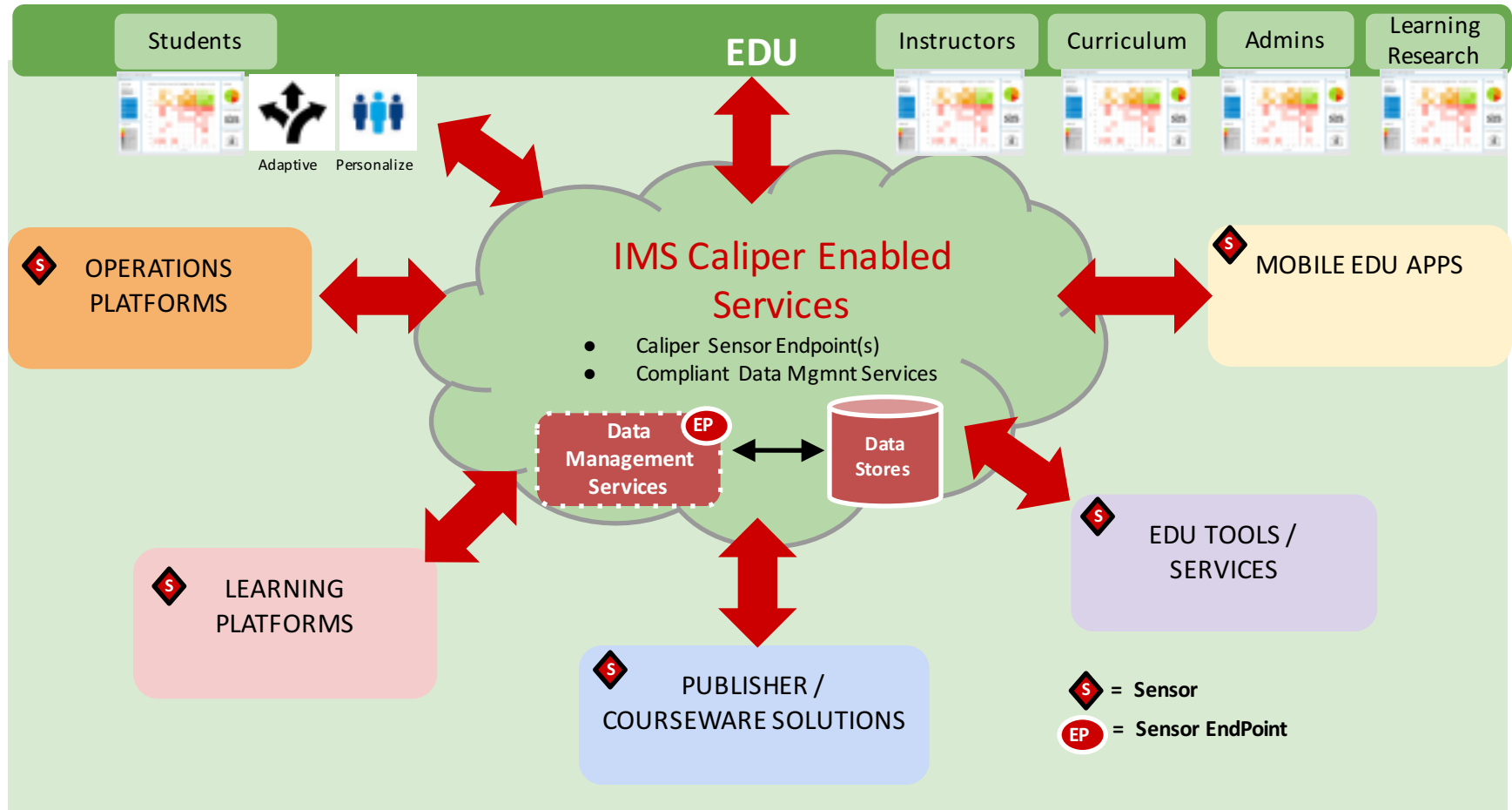for
Student:

Student
Progress
Compared to
Peers

Figure 3. Hypothetical learner dashboard showing progress and grades in comparison to historical performance. (Normal curve added to aid explanation)

Agenda

1. Brief Overview of Learning Analytics
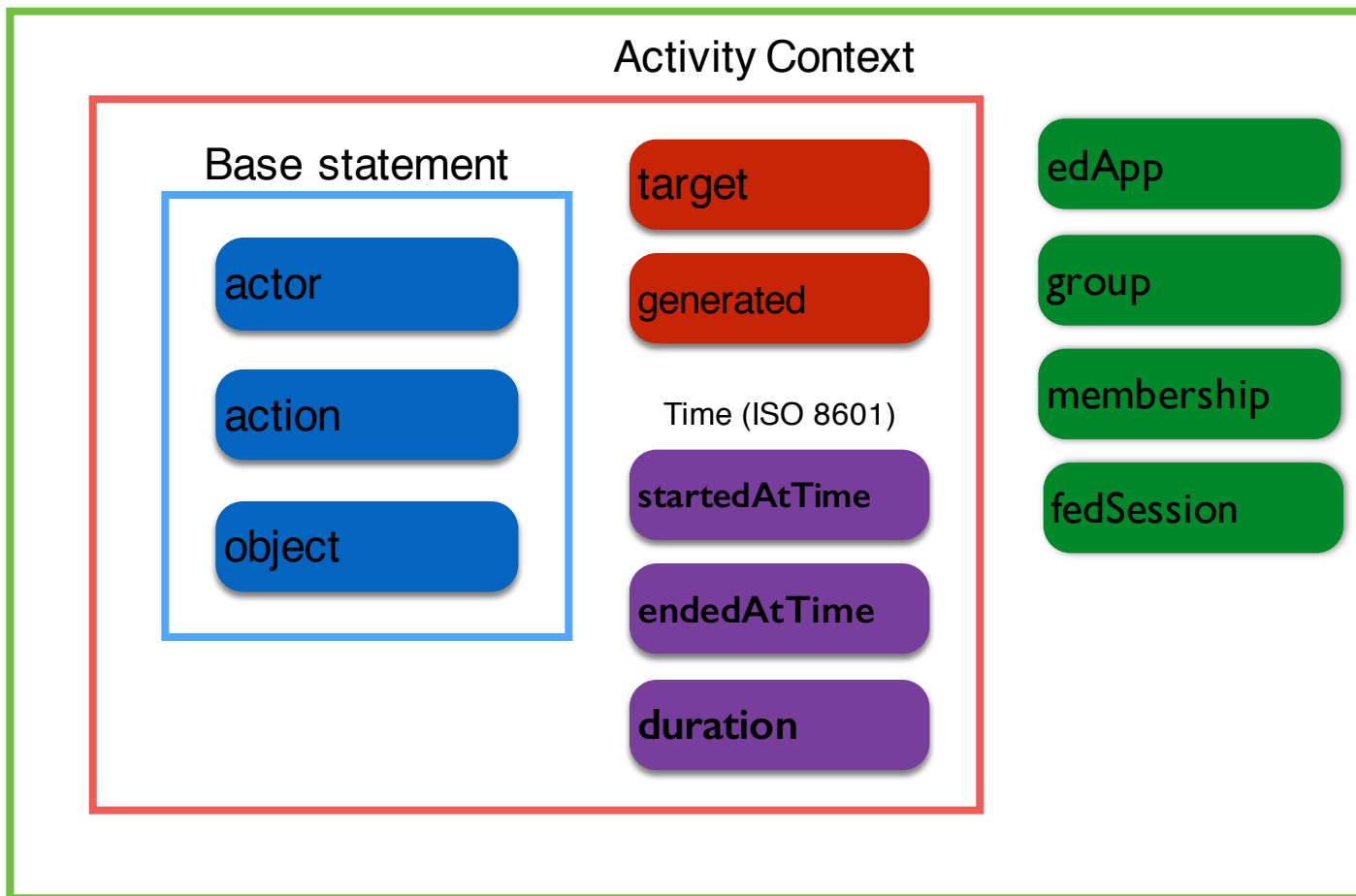2. **Progress of IMS Caliper Analytics**
3. Predictions for Next Year Progress
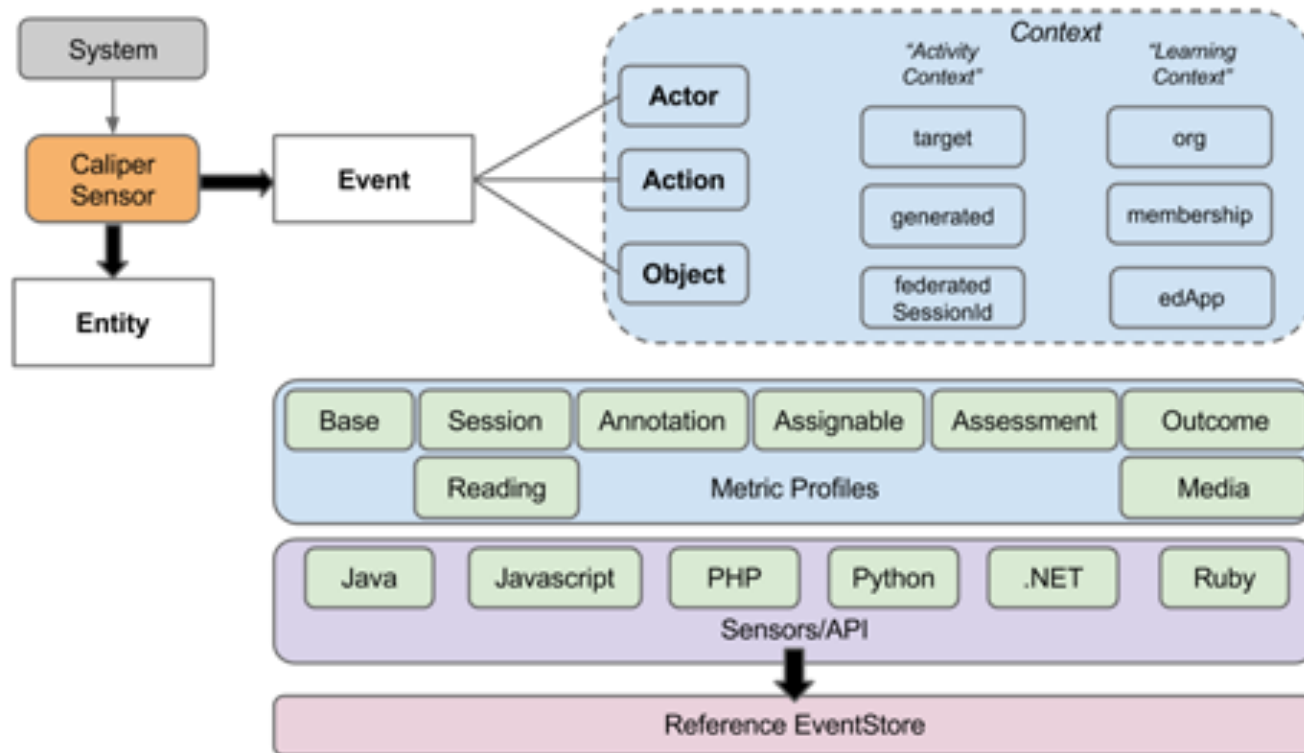
Caliper Learning Analytics Ecosystem

IMS Caliper: Click Stream Data for Learning Analytics

Why Caliper?

Standardization: encourage a common, extensible yet structured approach to describing, collecting and transporting learner interaction data for later consumption by researchers, educators, platforms, apps and services.

Innovation: provide a extensible data model, controlled vocabularies and an API that enables new uses of learner interaction data.

Interoperability: promote data exchange, sharing, mashups between systems, institutions and people.

Stewardship: evolve an EDU-optimized technical specification under the auspices of IMS Global and its member institutions and organizations.

Scope: Caliper

instrument   persist   use

describe
collect
transport

store

analyze
visualize
report
share
predict
intervene
adapt

feedback

Scope: Caliper 1.0

instrument

describe
collect
transport

persist

store

use

analyze
visualize
report
share
predict
intervene
adapt

INSIDE HIGHER ED

Enter your keywords

September 08, 2015
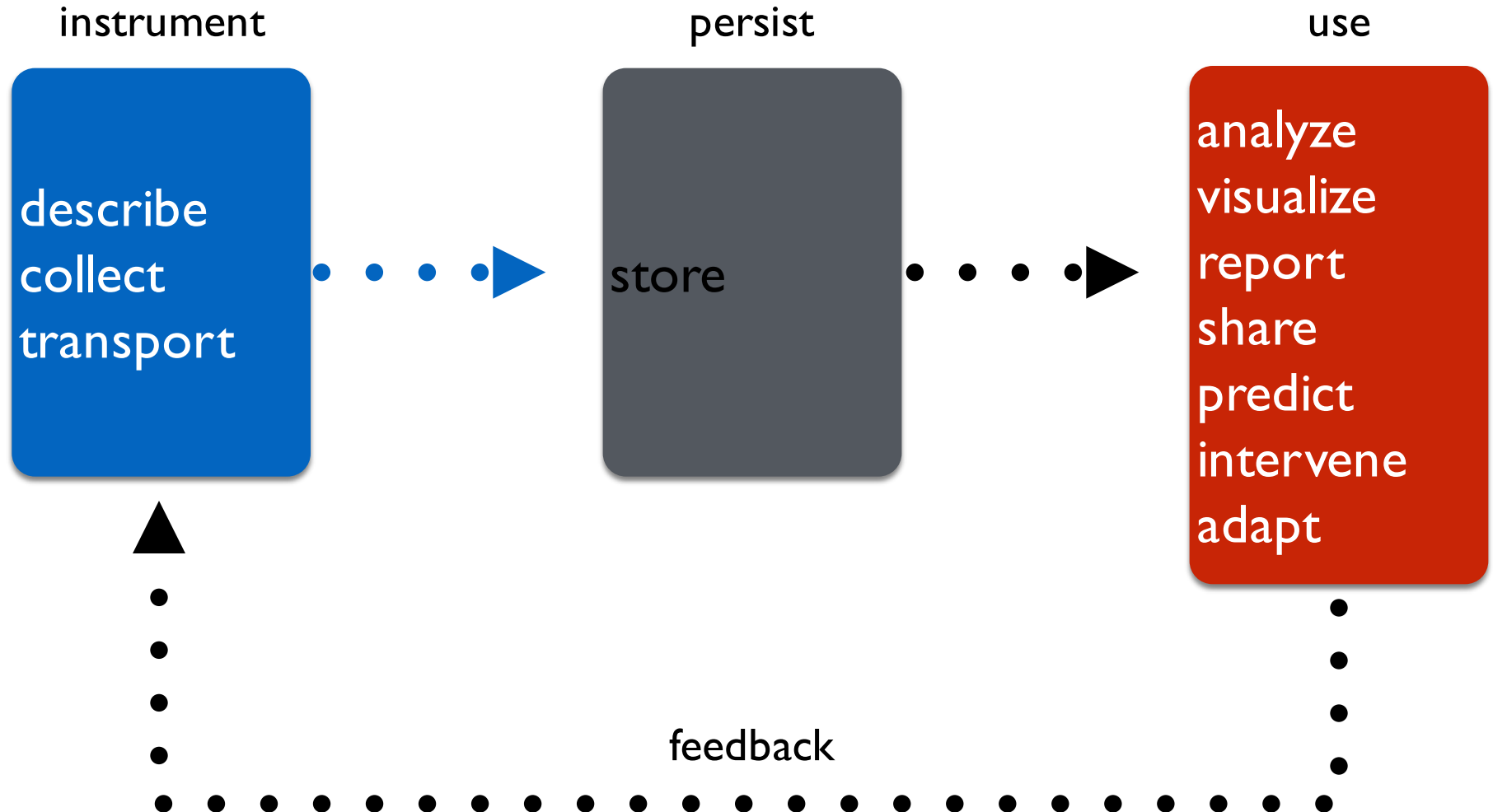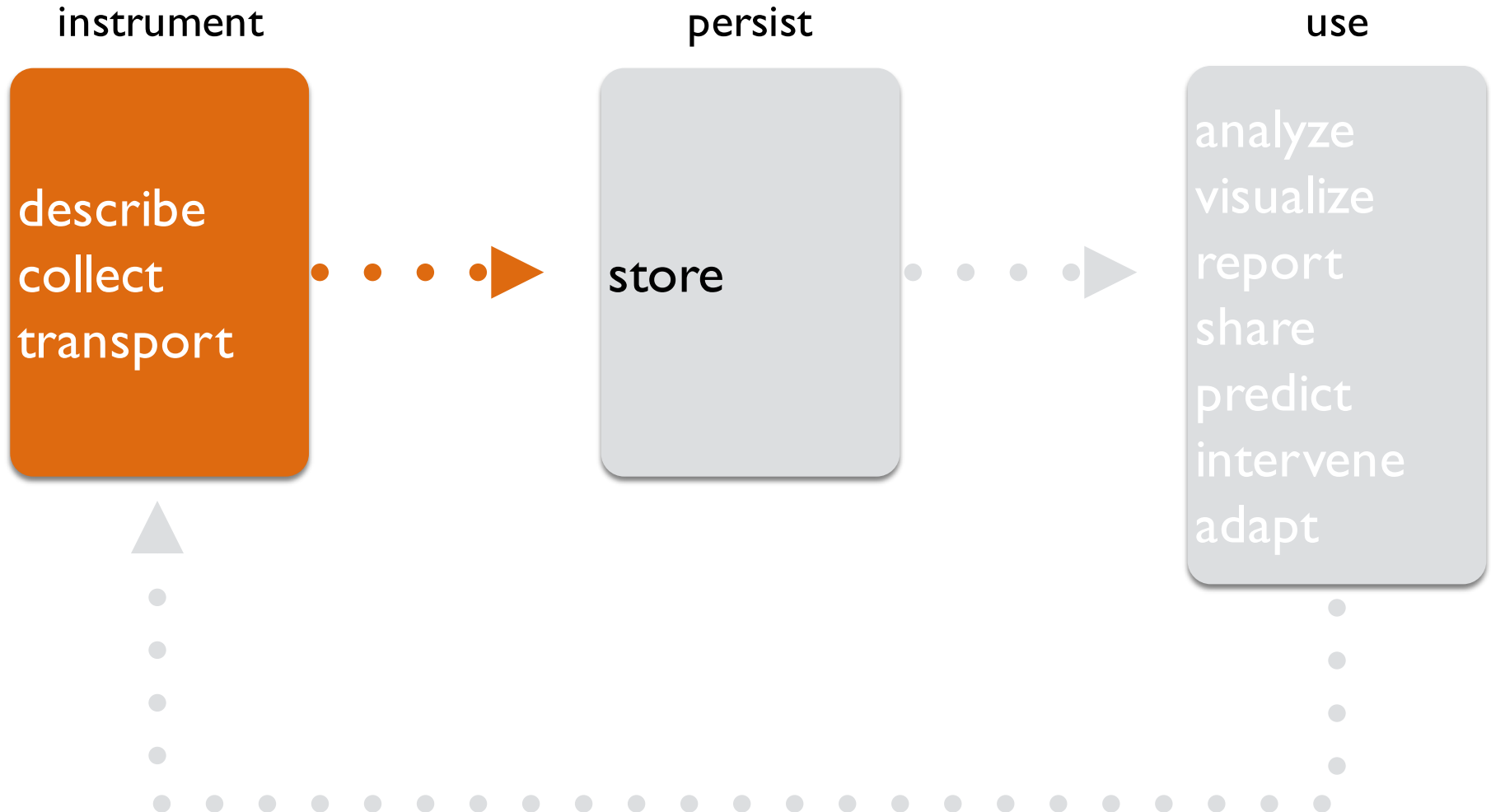
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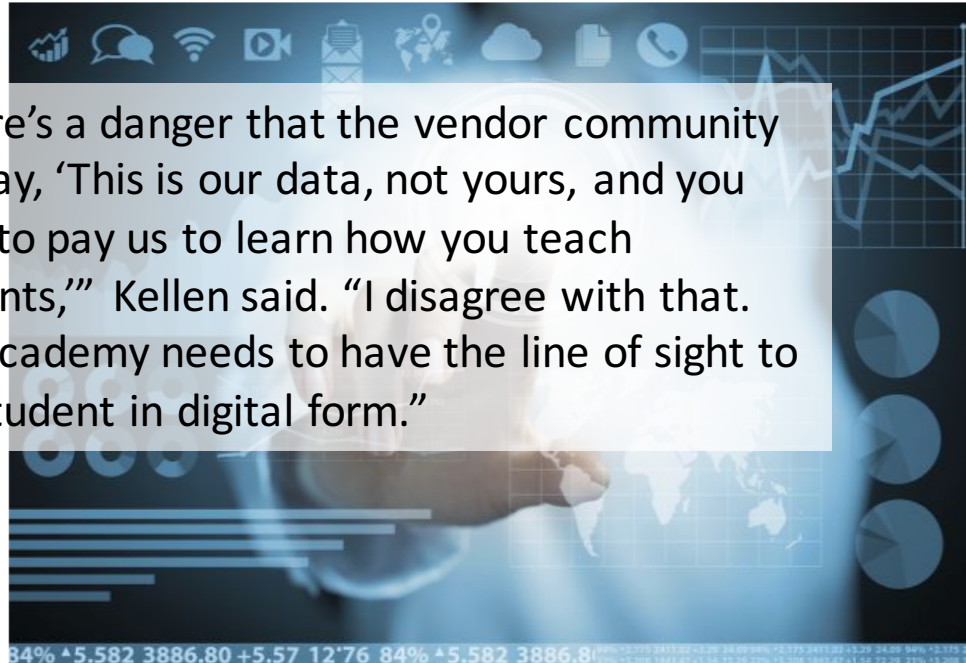ADMISSIONS | BOOKS | TECHNOLOGY | COMMUNITY COLLEGES | DIVERSITY | TEACHING & LEARNING | GLOBAL | AUDIO | BOOKLETS | MORE

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TECHNOLOGY

"There's a danger that the vendor community can say, 'This is our data, not yours, and you have to pay us to learn how you teach students,'" Kellen said. "I disagree with that. The academy needs to have the line of sight to the student in digital form."

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The Language of Learning Analytics

August 6, 2015

By Carl Straumsheim

The world of learning analytics is full of metaphors. Educational-technology companies are "islands," disconnected from one another. Data are locked away in "silos." As an initiative to standardize the collection and reporting of learning analytics nears a public launch, can colleges and vendors learn to speak the same language?

"Analytics" is one of the hottest buzzwords in education. For

ovum

Caliper, by the IMS GLC, will be the standard for how learning data is collected

"Caliper opens up access to meaningful data"

"Caliper is built around the IMS Learning Sensor API to define basic events and standardize metrics across different learning environments, and also uses IMS LTI standards to integrate standardized measurement with tools interoperability. Put together, Caliper is less about analytics, and more about the data standardization that will eventually drive learning analytics efforts."
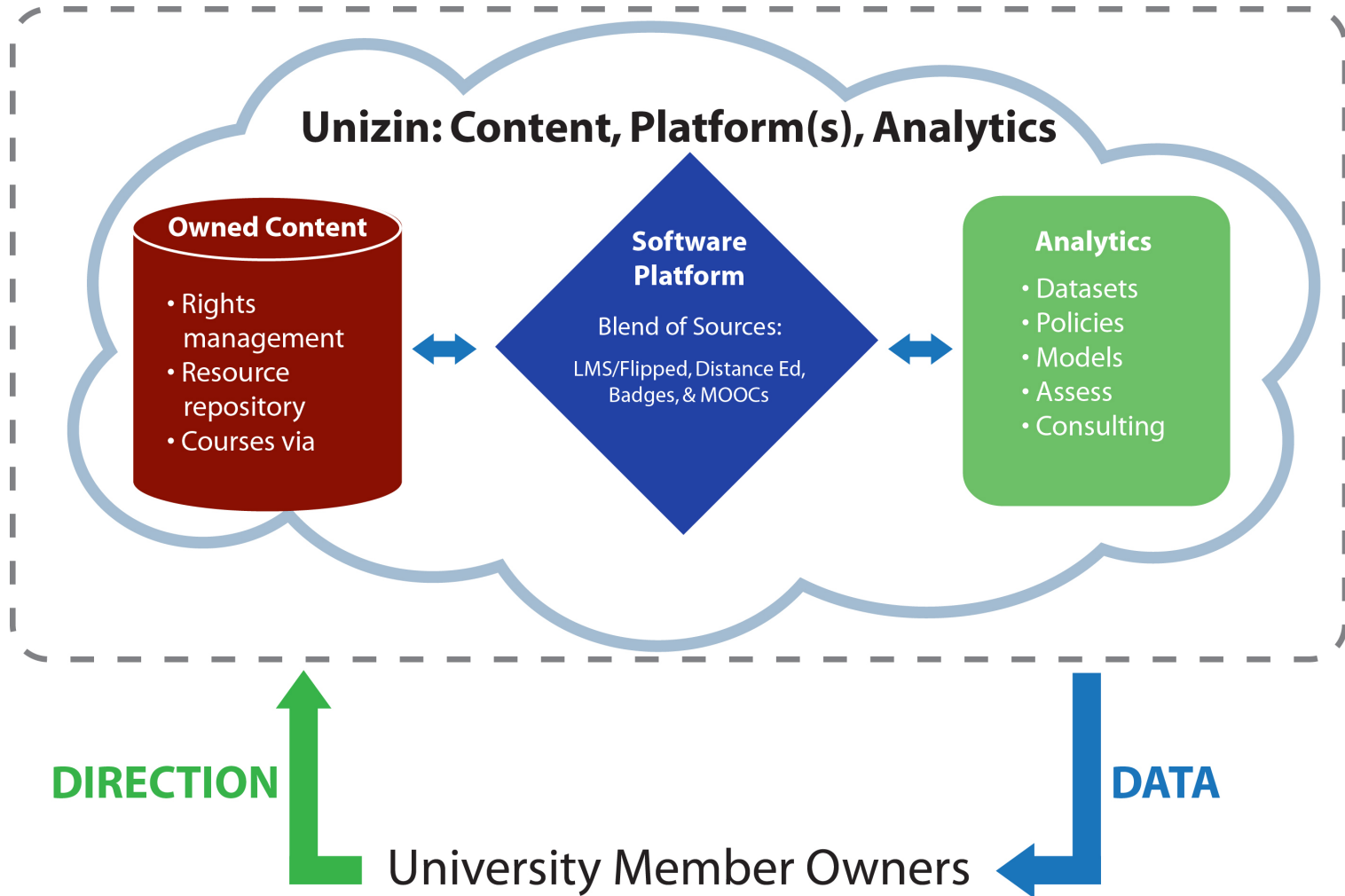
Unizin is a Major Caliper Initiative

Caliper Real-time Analytics Messaging*
(Caliper RAM)

*Processing thousands of events per second and responding with intervention messages within one second

Caliper fundamentals

Information model: standardized set of learning activity profiles & controlled vocabularies that extend set of foundational metrics.

API: governs the interactions between Caliper, apps, platforms, services, event store(s).

Sensor: code library designed to simplify instrumentation of platforms/apps/services. Multiple bindings: Java, JS, Ruby, Python, PHP, .Net.

Conformance: test suite ensuring implementation compliance.

Dev community: docs, presentations, bootcamps, reference implementations.

Caliper code repos (Github)

sensors

caliper-java

caliper-js

caliper-ruby

caliper-python

caliper-php (includes example)

caliper-net

sample code

caliper-java-example

caliper-net-example

support

caliper-contexts

caliper-conformance

caliper-common-fixtures

future?

caliper-model/profiles

caliper-docs

Agenda

1. Brief Overview of Learning Analytics
2. Progress of IMS Caliper Analytics
3. **Predictions for Next Year Progress**

Next 12 Months

- **Caliper** will be adopted by **a majority** of the **global market-leading learning platforms**

- **Caliper** will be used by **several major publishers** to collect **millions of events per week** to analyze and **improve quality of learning materials**

- **Several universities** will implement the **first ever real-time analytics messaging at scale** based on **Caliper RAM**

- **Caliper** profile to measure adoption/use of **e-text** and popular **learning tools** will be in production use by **a first wave of leading U.S. universities** and their suppliers

- **Synergies** between **learning analytics and digital credentialing/badges** will emerge in the context of **enabling student success**

Learning Analytics Challenges

- Need to start with good data

- Need to have a clear goal

- Need organizational culture and capacity to enact action

- To achieve any of the above in education, motivation for improvement must be compelling

- "Good judgment" is still required – as much an art as a science

Increase Organizational Capacity for Learning Analytics

1. Leadership

2. Cultural/Behavioral Change

3. Build Competencies in Data Analysis/Evaluation

4. Design Thinking/Partnerships

5. Infrastructure and Tools

Pugliese,L.C. (2010). A New Age of Learning Management Analytics. Whitepaper published at edu1word.org.

Thank You!

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