

Using xAPI and Learning Analytics in Education

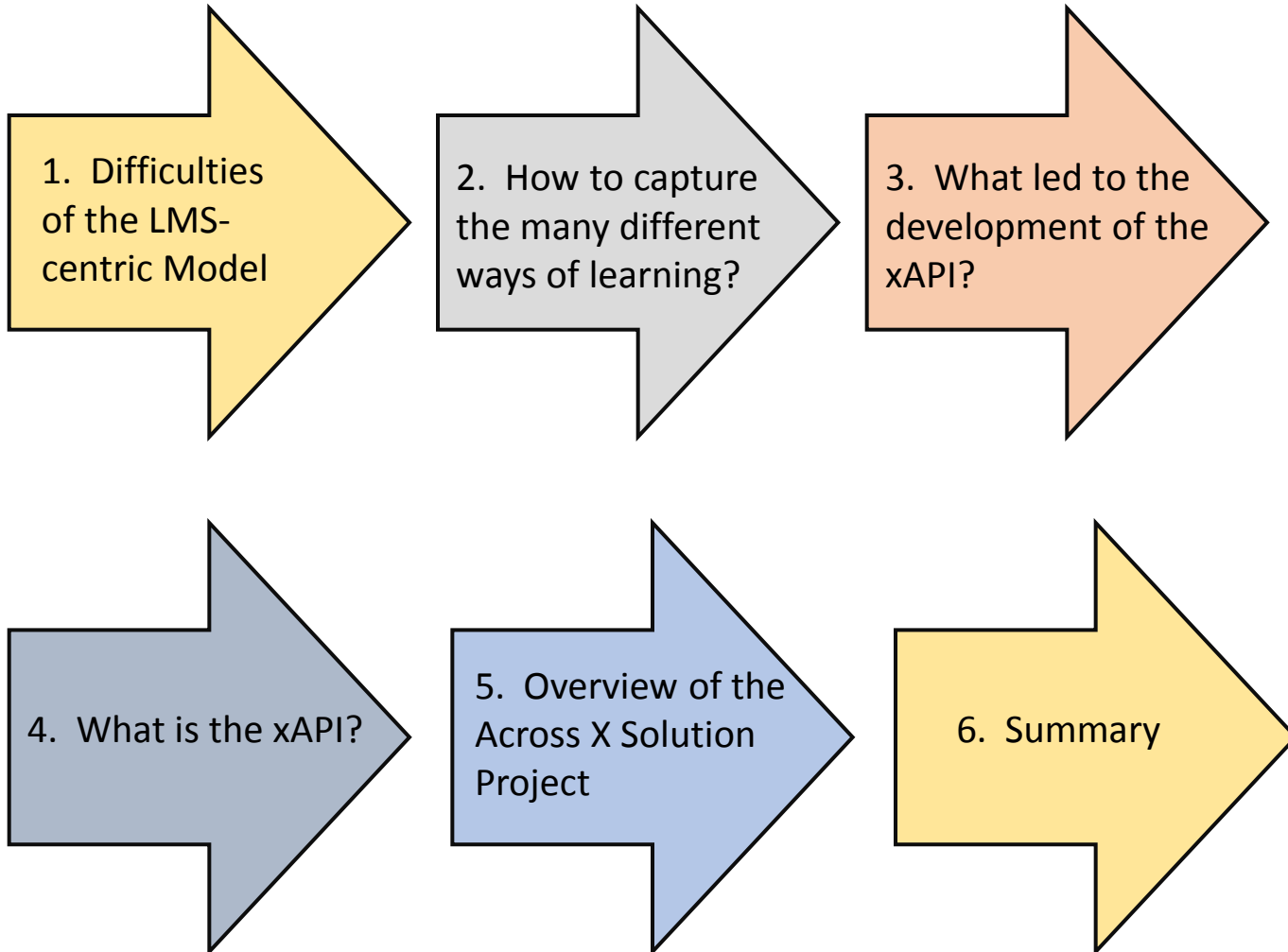
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Agenda



1. Difficulties with the LMS-centric Model

LMS must
always
connect to
the Internet.

LMS can't
consolidate
with learning
from different
devices &
social media.

Teacher is
still the
knowledge
dispenser &
content
organizer.

Content is
mostly text-
based.
Learning is
very linear!

MCQs
always
have single
answers.

2. How to capture the many different ways of learning? - 1



How do you know that your student has learnt something from a mobile app?
Or an augmented reality episode?

2. How to capture the many different ways of learning? - 2

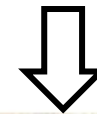


Simulated attack by soldiers with armored and air support.

Have your student adopted the optimal strategy in this exercise?

Aircraft simulation for pilot training.

Has the pilot mastered the skill to land the aircraft safely?



2. How to capture the many different ways of learning? - 3



Impossible to track what is going on in all the social media!

Might be easier to get the participant inform us what he or she does in the social media!

2. How to capture the many different ways of learning? - 4



Seaport



Multiparty discussions with Red Cross



Future outdoor performance



Navigating the future city

3. What led to the development of the xAPI?

SCORM is 15 years old. It was first released in year 2000.

People now communicate & collaborate more with mobile devices.

People do not connect mobile devices to the Internet for 24 hours per day.

People learn differently: texting, desktop learning, iPad, Android phones.

Rustici S/W commissioned to develop new e-learning specification.

4. What is the xAPI? - 1

Stands for Experience API, or xAPI

Also commonly referred as Tin Can API

Set of open specifications to track learning experiences

Versions:
0.90 – 0.95
0.95 – 1.0.0
1.0.0 – 1.0.1
1.0.1 – 1.0.3

It is still evolving!

Commonly regarded as next generation after SCORM



4. What is the xAPI? - 1



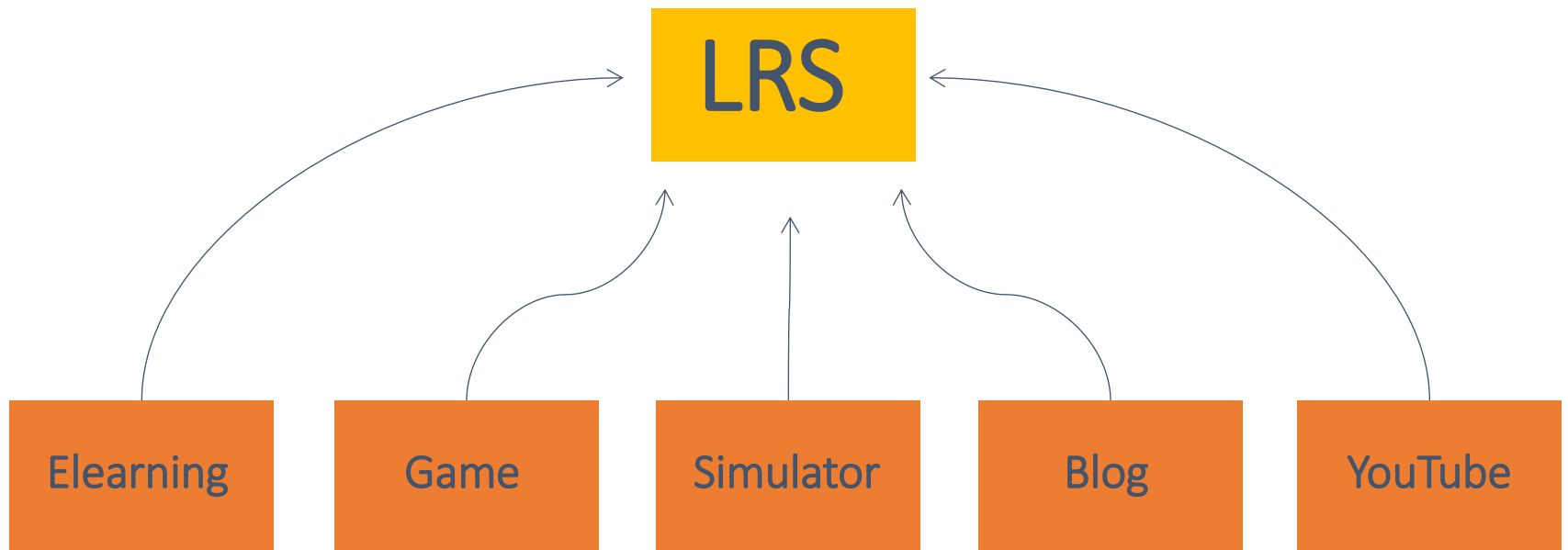
4. What is the xAPI? - 2

Model	Actor	Verb	Object
	↓	↓	↓
Example	Andrew	Experienced	Solo Hang Gliding
	↓	↓	↓
Unique ID	<code>andrew@example.com</code>	<code>http://adlnet.gov/expapi/verbs/experienced</code>	<code>http://example.com/activities/solo-hang-gliding</code>

The basic elements and structure of an xAPI statement.
Use JavaScript Object Notation (JSON) to specify statements.

4. What is the xAPI? - 3

LRS – Learning Record Store



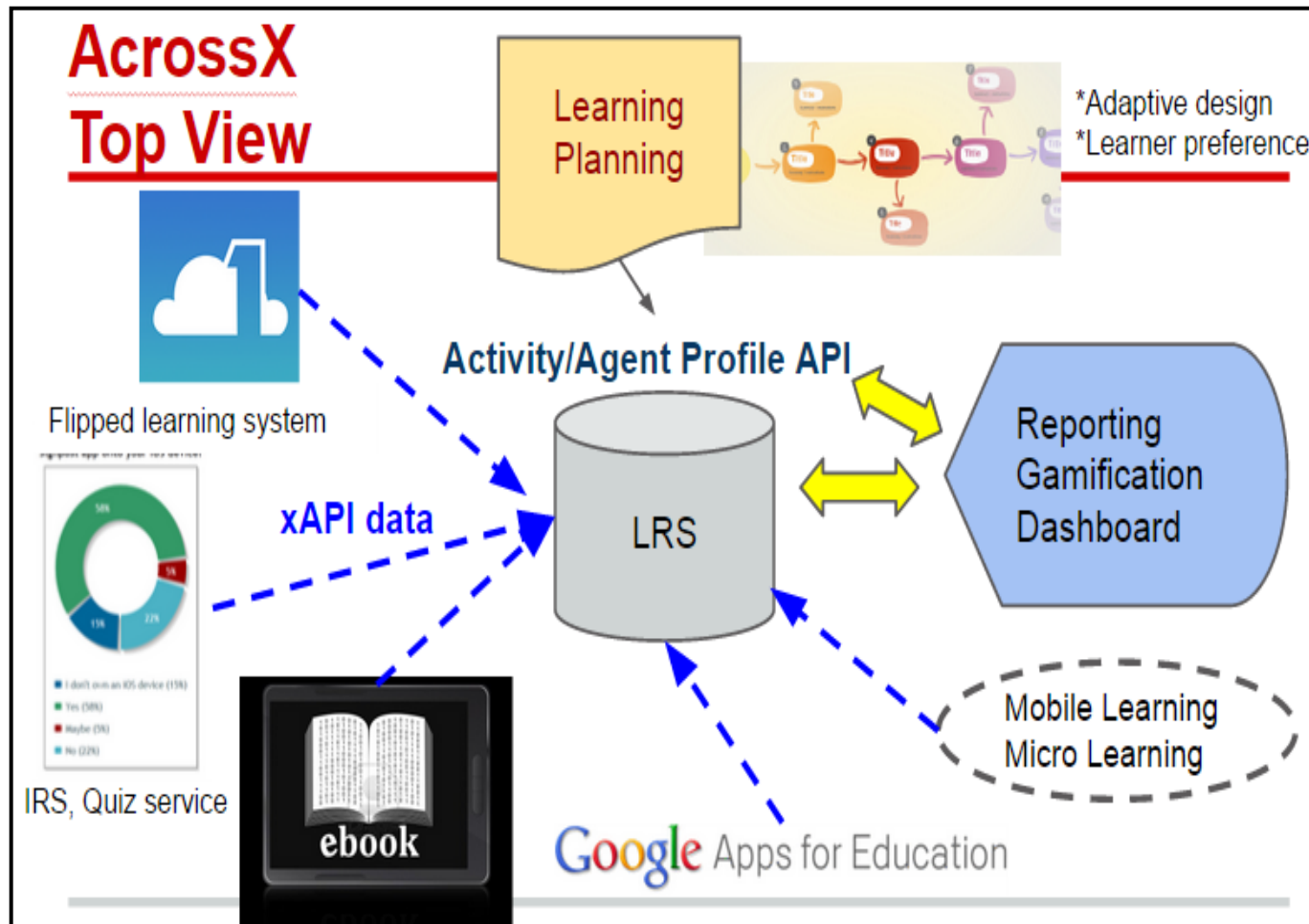
4. What is the xAPI? - 4

xAPI statement in JSON (JavaScript Object Notation)

```
{
  "actor": { "mbox": "mailto:rob.faulkner@webanywhere.co.uk"},
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/attended",
    "display": { "en-US": "attended" }
  },
  "object": {
    "id": "http://learn.mydomain.com/activities/tin-can-learning-course",
    "objectType": "Activity",
    "definition": {
      "name": { "en-US": "Tin Can Learning Course",
                "fr-FR": "Cours d'apprentissage Tin Can",
                "es-ES": "Tincan Curso de Aprendizaje"
              },
    }
  }
  "extensions": {
    "http://learn.mydomain.com/extensions/languageChosen": "spanish"
  }
  "results": {
    "grade": "pass",
    "score": 95
  }
}
```

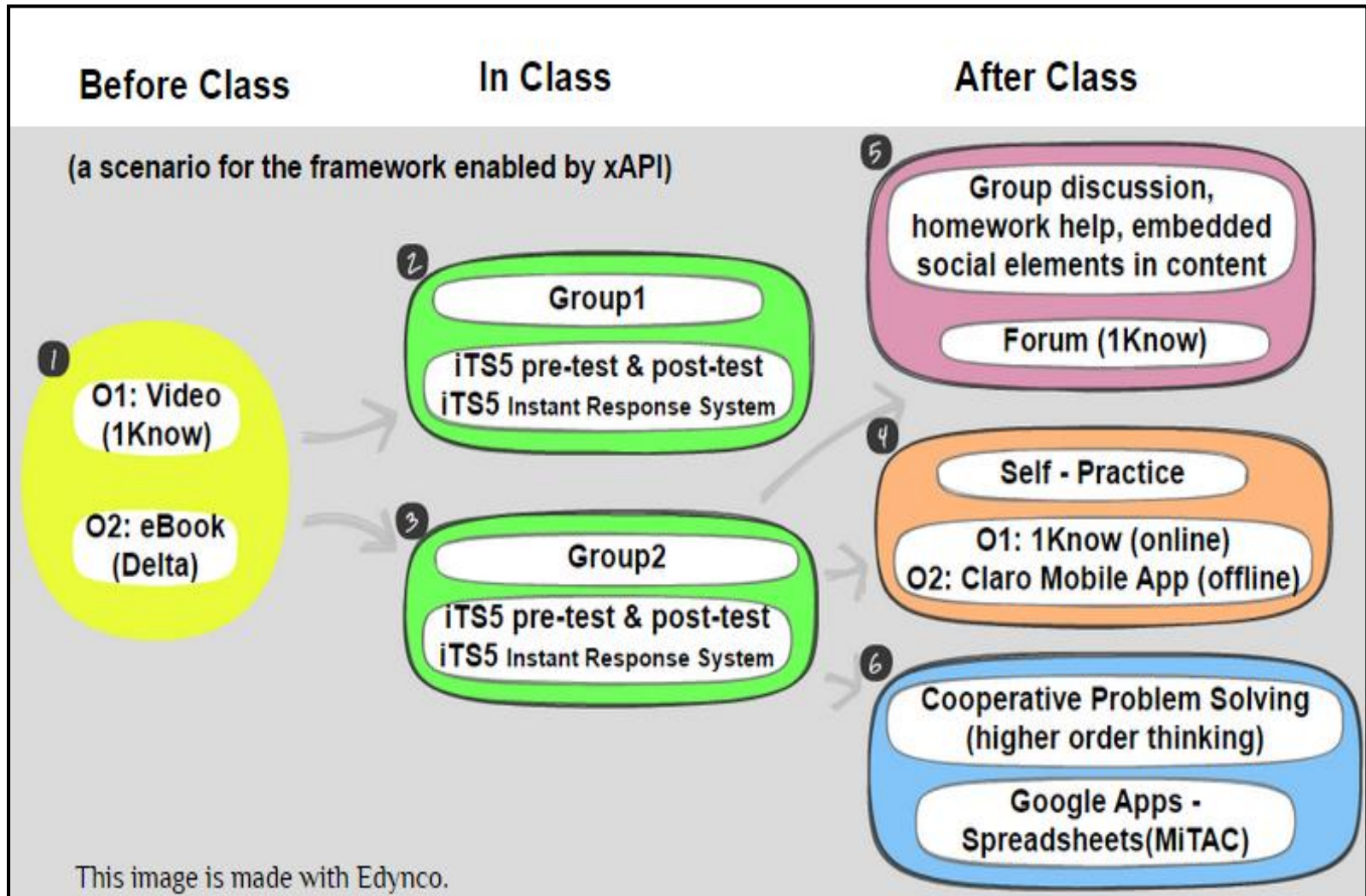
Example of a valid xAPI statement (from slide 21 in presentation by (Faulkner, 2015))

5. Overview of the AcrossX Solution Case Study



Top view of data workflow from different tools (IRS – Instant Response System; LRS – Learning Record Store; xAPI – Experience Application Programming Interface)
(Classroomaid, 2015)

5. Different teaching / learning scenarios and the student activities



(Reference: (Classroomaid, 2015))

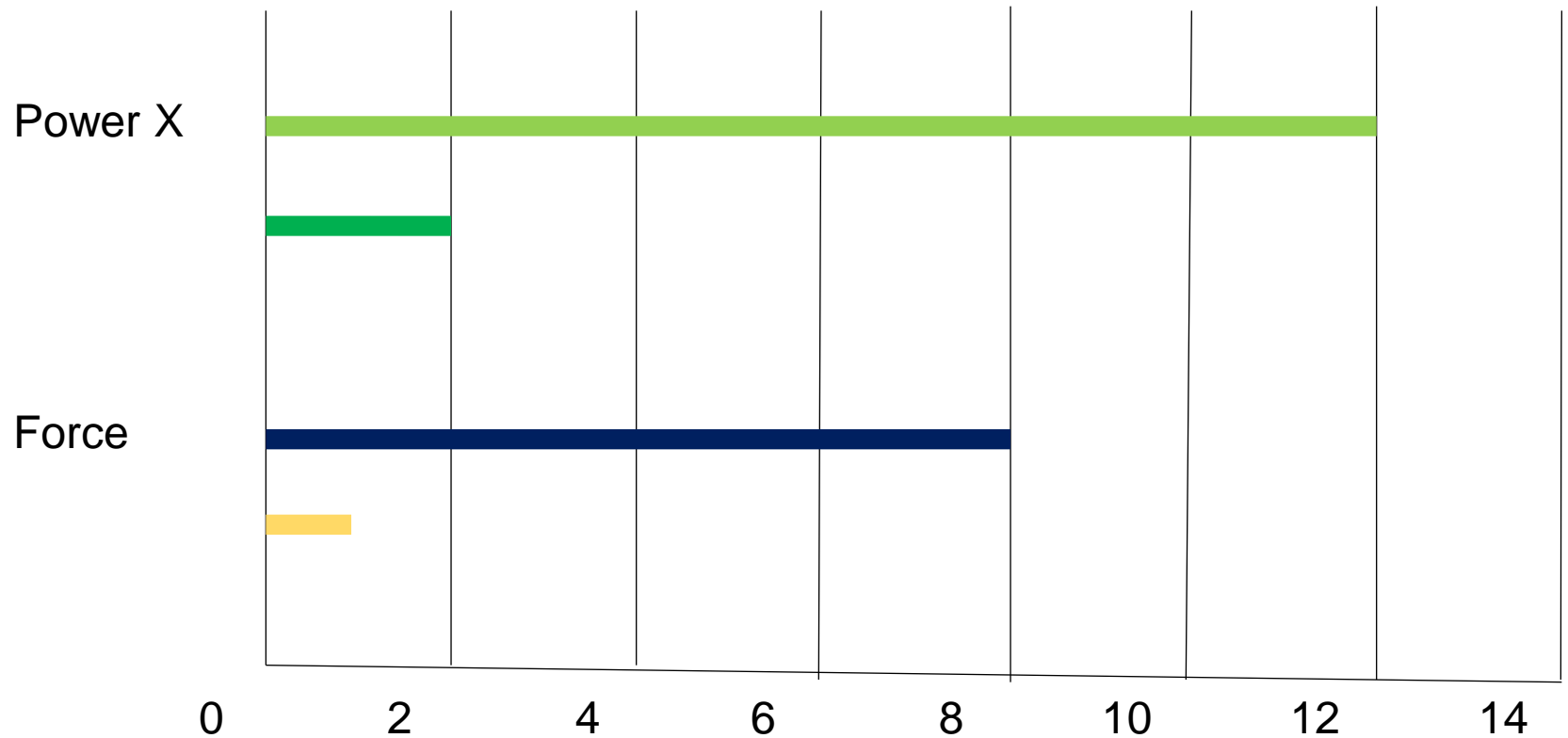
5. Metrics used by teacher to encourage different competency levels (Classroomaid, 2015)

Metric	Meaning	Example
XP	Efforts, engagement	Time spent in all activities
PowerA	Personal competency in subject knowledge	Test scores; Scores on thinking process (<i>evaluation & input by teacher</i>)
PowerX	Study skills	Verb counts from ebook, video, self-practice & interactions with feedback widget
Force	Soft skills	Verb counts from forum, etc Evaluation by teacher

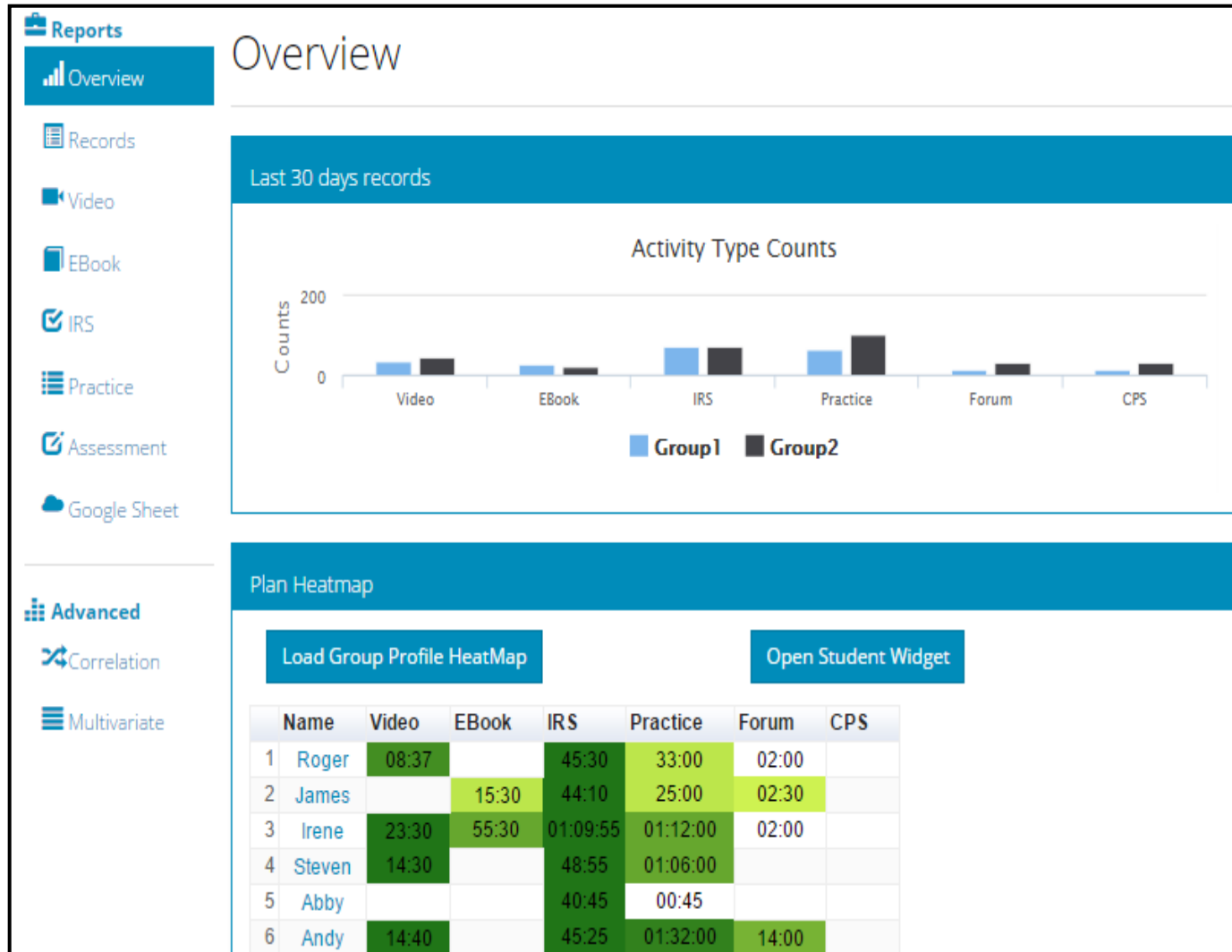
5. Gamification metrics introduced by teacher (Classroomaid, 2015)

Roger	
XP	Power A Level
2377	3 - 5

Learning Power



Reports that can be generated from the LRS – e.g. Activity type counts, individual learning activities of students (Classroomaid, 2015)



Learning Analytics Metrics

Here are some possible learning analytics metrics that can be extracted from the AcrossX Solution case study. (Reference: Gschwind, J., n.d.)

Pages read
versus pages
skipped

Time spent
on each page
or section

Correct/incorrect
responses to
specific
assessment
questions

No. of
attempts for
each question

How long does
the student view
the
demonstration
video?

Correct / incorrect
moves inside
interactive
simulation
exercises

6. Summary

xAPI:
Experience
Application
Programming
Interface

xAPI also
known as
the Tin
Can API

Open
Specs for
tracking
learning
experiences

Now at
Version
1.0.3 and
is still
evolving!

Regarded
as the next
generation
after
SCORM

xAPI
statement:
[Noun]
[Verb]
[Object]

xAPI
statements
stored in
an LRS

xAPI &
Learning
Analytics
used to
improve
learning

End of Presentation

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