Getting Ready For Adaptive Learning

Getting Ready for New Business Model

EEPГ Network meeting Tel-Aviv
Digital Revolution And Other (Content Oriented) Industries

Music

eBooks

Dictionaries

Press
Who Is The Beneficiary?

Google

Apple

Spotify

Amazon
Why?
Service Providers vs Content Providers

- Traffic (platforms / gate keepers)
- Data (user behaviour / preferences)
- Data analytics
- Personalisation (advertisement)
What Does Digital Revolution Mean For Education Industry?

I have seldom heard him mention her under any other name in his own speeches and pronouncements. His words were not at all to his mind, precise but admirably balanced. He was, I take it, the most perfect reasoning and observing machine that the world has seen, but a man he would have placed himself in a false position, the every word of the other position, now with a gibe and a sneer. They have admirable things for the observer—excellent for classifying the veil of men's tastes and actions. But for the trained reasoner to admit such intrusion into his own delicate and finely adjusted temperament was to introduce a disturbing factor which might throw a doubt upon all his mental results. gilt is a sensitive instrument, or a crack in one of his own high-power lenses, would not be more disturbing than a strong emotion in a nature such as his. And yet there was but one woman in his, and that woman was the late Irene Adler, of dubious and questionable memory.

I had seen little of Sherlock lately. My marriage had drifted us away from each other. My own complete happiness, and the free-controlled influence which rose up around the man who first finds himself master of his own establishment, were sufficient to absorb all my attention, while Holmes, who had been every form of society with his whole being and, remained to see if there was any one, in Baker Street, he was still, as ever, deeply attracted by the study of crime, and accepted his immense facilities and
Is It Enough To Have an Interactive Content...?
…content will become a commodity, where the real value add will be the knowledge which content should be selected for each individual student…

… based on Big Data analytics?
Adaptive Learning Black Box

- Content
- Users

DATA & ALGORITHMS

Personalisation Adaptive Learning
Data are created when user (student) interacts with the content

Where The Data Come From?

How to build your interactive content to collect the valuable data?
Easy answer?

... or big mistake?
Content Should Not Be Built as HTML5 Objects
XML Content and Player (Middle Layer)
Creating HTML5 Content

One standard Player...

...serves all your content...

...and it is able to generate DATA.

...creates HTML5 content...
Player As a Part of Authoring Tool

- Secures data collection
- Improve production cost & efficiency
- Independence
- Unification of publishing processes
- Easy maintenance
- Standardized competencies
- Security and content ownership
What can and what cannot be secured by correct choice of Authoring Tool?
Properties of Exponents

If \( a \) and \( b \) are real numbers and \( m \) and \( n \) are any integers, then:

- \( a^m \times a^n = a^{m+n} \)
- \( a^m \div a^n = a^{m-n} \), \( a \neq 0 \)
- \( a^m \times b^n = (a \times b)^{m \times n} \)
- \( a^m \div b^n = (a \div b)^{m \times n} \)
- \( (a^m)^n = a^{m \times n} \)

Find the missing numbers.

\[
\begin{align*}
(5^2)^3 &= 5^6 \\
8^3 \times 8^9 &= 8^{12} \\
\left(\frac{1}{2}\right)^3 \div \left(\frac{1}{2}\right)^{-10} &= \left(\frac{1}{2}\right)^7 \\
16^2 \times 2^3 &= 2^{10} \\
(-20)^4 \div (-6)^4 &= 6 \\
\end{align*}
\]

Find the missing numbers.

\[
\begin{align*}
(7^{-2})^4 &= 7^{-8} \\
4^3 \times 4^4 \times 4^6 &= 4^{13} \\
2^3 \div 5 \times 5^3 &= 5^4 \\
3^6 \times 4^4 \div 2^8 &= 1 \\
(-8)^3 \div 4^2 &= 8^3 \\
\end{align*}
\]
Adaptive Learning Sequence / Lesson Level

**Mathematics**

**Quadratic Function**

A quadratic function is a function that can be represented in the form 
\[ y = ax^2 + bx + c, \]
where \( a, b \) and \( c \) are arbitrary real numbers with \( a \neq 0 \).

**Indicate all the quadratic functions.**

\[
\begin{align*}
&y = 1 + 2x + 3x^2 - 2x - 1 & y = (2 + x)^2 \\
&y = 2 - x - 3x^2 & y = 3x + 1 - 2x + 1 \\
&y = \frac{x^4 + x^2 + 1}{2} & y = x^2 - (x + 1)^2 \\
&y = (x^2 + x)^2 + (2 - x)^2 - 2x^4 & y = x + 5^2
\end{align*}
\]
Adaptive Learning Course Level

- Pre-Assessment Lesson
- Remedial Lessons
- Main Topic Lesson with enhanced feedbacks and adaptive algorithm on a sequence level

Enhancement Activities
Remedial / Drill & Practice Activities
Next Topic

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Adaptive Learning
Course / Cross Subject Level

Moving from content related algorithms to platform (LMS) related algorithms
Algorithms Defined At The LMS Level
Adaptive Learning – Four Levels

- **Learning Object Level**
- **Sequence / Session / Lesson Level**
- **Course / Subject Level**
- **Cross Subject Level**
- **Authoring Tool (Player) Level**
- **Authoring Tool (Player) Level + LMS Level**

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Generating Educationally Relevant Data

Authoring Tool / Player
- “Results” Data
- Results
- Learning styles
- Abilities
- Validation

LMS
- “Events” Data
- Users
- Schools
- Geo-location
- Calendar
The Authoring Tool and Player are at the centre of a digital strategy based on Big Data analytics for adaptive and personalised learning solutions.
Conclusions

- Develop your content in a unified way (choose, preferably, one authoring tool for all your content development).
- Make sure that all your developed content is delivered by one Player.
- Make sure that this Player is able to generate and send educationally relevant data to your LMS.

- Choose an LMS (delivery platform) that will be able to collect data from your Player.
- Make sure that LMS generates “event” type data.
- Make sure that your LMS allows you to define your adaptive algorithms at the course level.
- Make sure that LMS uses future-proof Big Data storage.
- Make sure you will be able to apply flexible (not dependant on your LMS) analytics to your collected data.
Thank You!

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