

Definição e Aplicação de MOOCs e do Modelo *Flipped Classroom* como Apoio ao Ensino de Computação

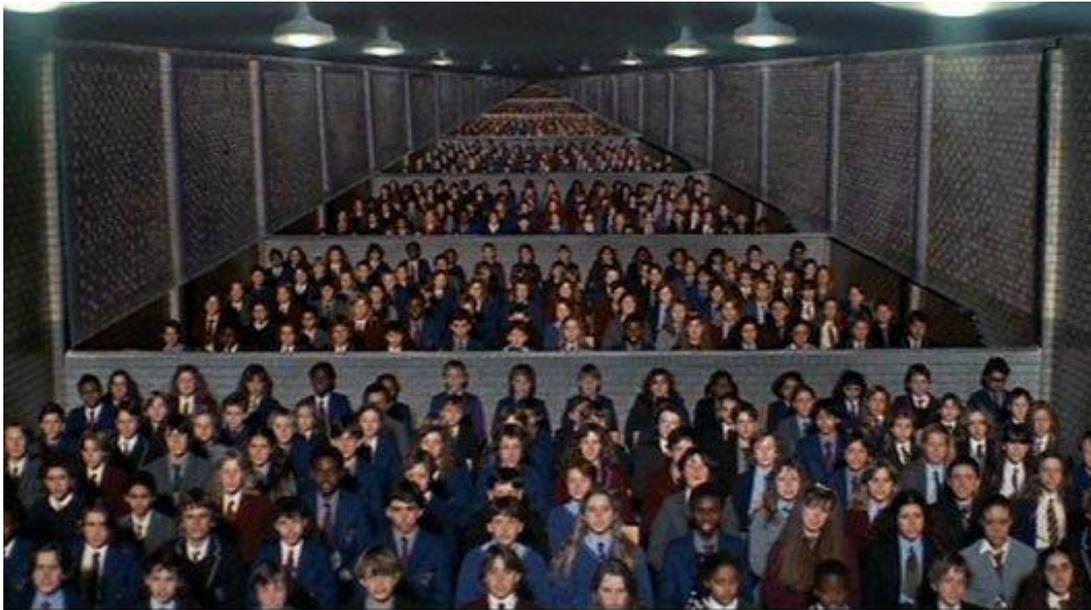
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Contexto



Columbia



Tecnologias Digitais



Metodologias de Ensino

21st Century Student Outcomes and Support Systems

Adapt to Change

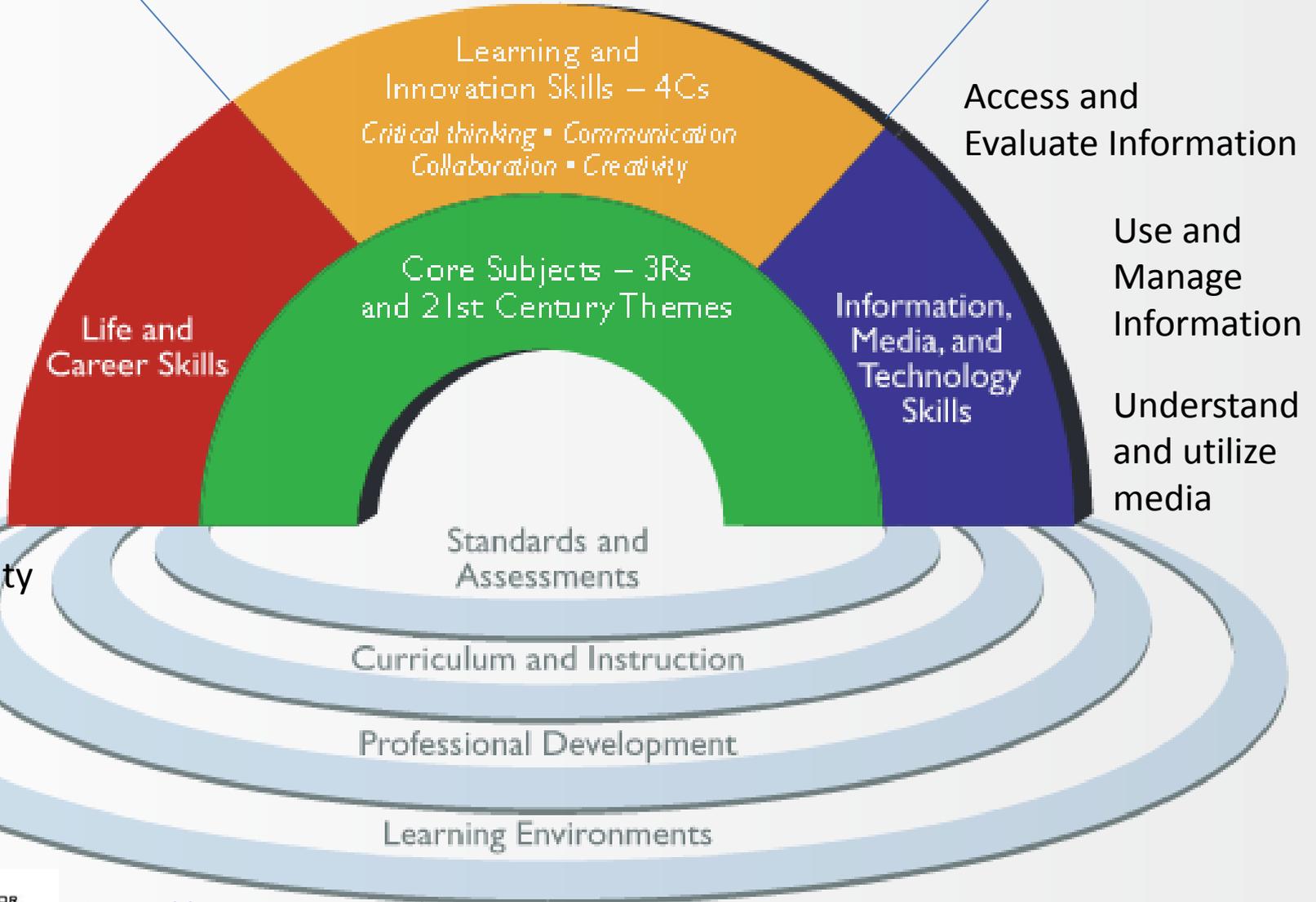
Be Flexible

Initiative

Be Self-directed Learners

Leadership

Responsibility

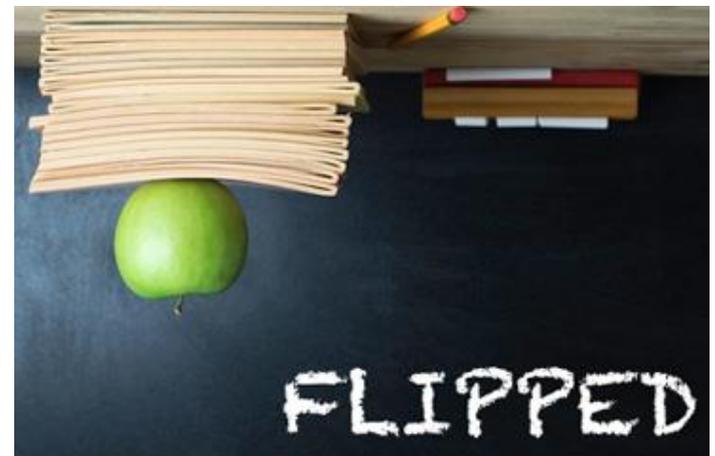
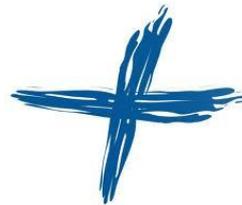
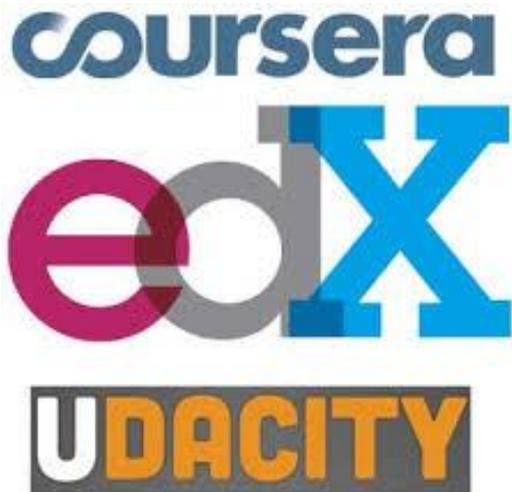


PARTNERSHIP FOR
21ST CENTURY SKILLS

<http://www.p21.org/>

Contexto

- **Tec. Digitais:** *Massive Open Online Courses (MOOC)*
- **Met.Ensino:** *Flipped Classroom Teaching Model (FC)*



The Traditional Classroom

Teacher's Role: Sage on the Stage



The Flipped Classroom

Teacher's Role: Guide on the Side



<http://www.flippedlearning.org/>

Passive subject of their own learning.

Students have **homework**

Students have **lectures in classroom**

Active subject of their own learning

Receive **short explanations** that should be studied **before each class**
(video/podcast/website/book)

Available anywhere: at home, at work, bus, ...

In the Classroom: take **active** and **collaborative** activities with the support of the teacher

Problema(s)

- MOOCs atuais: *one-size-fits-all* learning model.
- Replicam a Sala de aula tradicional
 - xMOOCs → Behaviorismo
 - (Tendência: Construtivista, Sociointeracionista)
- Evasão.
- A grande quantidade de informações geradas a partir da interação dos usuários com os MOOCs

A Nossa Proposta

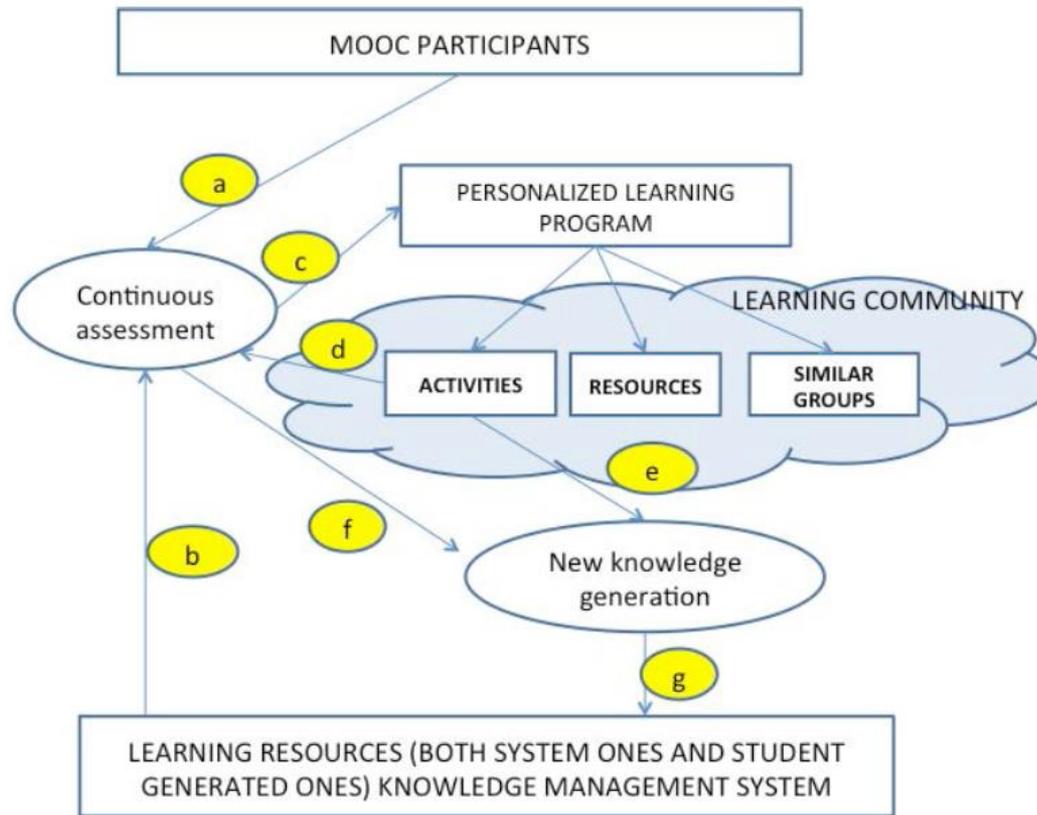
- Para alcançar a personalização do ensino em um MOOC, nós postulamos que a literatura sobre:
 - *Flipped Classroom*
 - *pre-class, warm-up, master learning ?*
 - *Personalização/Adaptação/Customização*
 - *Personal Learning Environments (PLE) ?*
 - *Mass Customization (MC)*

pode nos ajudar a obter *insights* importantes.

Objetivo Principal

- Investigar a aplicação de conceitos e princípios do modelo *Flipped Classroom* no projeto, desenvolvimento e disponibilização de MOOCs.
 - Adicionalmente, utilizar a informação produzida e armazenada nos MOOCs para promover sua própria adaptação e personalização.

Abordagens



Ausência de rigor científico.

Avaliações “fracas”.

A methodology proposal for developing Adaptive cMOOC [3]

Abordagens

- NovoED
 - Student-centered Online Learning Environment
 - Collaboration and Teamwork



Amin Saberi

Amin Saberi is co-founder of NovoEd. He is also a professor at Stanford University where he developed an earlier version of the platform used to offer Stanford courses to hundreds of thousands of students. His research focuses on the intersection of computer and social sciences and he is co-director of Social Algorithms Lab. As of January 1, 2013, he has taken a leave of absence to pursue NovoEd full time.



Farnaz Ronaghi

Farnaz Ronaghi is co-founder and Director of Engineering at NovoEd. She designed and developed the Venture Lab platform at Stanford University while a PhD student. She is passionate about making education, as a basic human right, more accessible and meaningful through collaboration and experiential learning. As of January 1, 2013, she has taken a leave of absence from work on her PhD thesis on the creation of social incentives in online learning to pursue NovoEd full time.

Stanford University

Abordagens

- Can You Flip an Online Class?
 - Barbara Honeycutt
 - North Carolina State University



Honeycutt, B. & Garrett, J. (September 2013). **The flipped approach to a learner-centered class.** (whitepaper). Magna Publications.

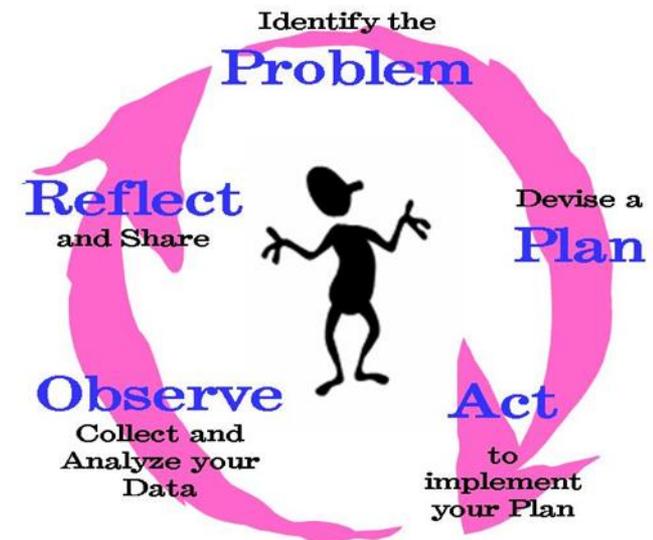
Honeycutt, B. & Glova, S. (2013). **101 Ways to Flip Your Online Class.** Flip It Consulting & Reify Media. Raleigh, NC.

Resultados Esperados

- Definição de um conjunto de requisitos/abordagem de personalização para MOOCs.
- Projeto, desenvolvimento e disponibilização de um MOOC personalizado (na área de Ciência da Computação).
- Contribuir para a utilização efetiva de MOOCs personalizados em cenários reais de ensino e aprendizagem.

Metodologia

- **Revisão Sistemática:** pra descobrir lacunas e conhecer melhor a área.
- **Pesquisa Ação como abordagem principal**
 - Flipped Classroom
 - MOOCs
 - Integração/Personalização/
Adaptação/Customização
 - Experimentos em Computação.



Resultados já obtidos

- Experimentos e *Flipped Classroom*
 - *Tools for the Flipped Classroom Model: an Experiment in Teacher Education*
 - *Frontiers in Education (FIE), Madri.*
 - *Testing Flipped Classroom and Problem-Based Learning in a CS1 Course*
 - *Em processo de submissão.*

Resultados já obtidos

- Uma revisão sistemática sobre MOOCs
 - *Construção e Uso de MOOCs: Uma Revisão Sistemática*
 - SBIE, Congresso Brasileiro de Informática na Educação (CBIE), Dourados.
- Experimentos e MOOCs
 - *Avaliação dos MOOCs Coursera e edX a partir da Condução de Estudos Experimentais*
 - *Em processo de submissão.*

Resultados já obtidos

- *Melhorando Experiências Acadêmicas*
 - *A Recommendation System to Support the Students Performance in Programming Contests*
 - *Frontiers in Education (FIE), Madri.*

Experimental Platform for Online Education at Scale

- Google Course Builder

- <https://code.google.com/p/course-builder/>

The screenshot shows the Google Course Builder project page. At the top, there is a navigation bar with links for "Project Home", "Downloads", "Wiki", "Issues", and "Source". Below this, there are tabs for "Summary" and "People". The main content area is divided into two columns. The left column contains "Project Information" with details such as "Stared by 1159 users", "Code license Apache License 2.0", "Labels" (CourseBuilder, OnlineEducation, Education, MOOC, Academic, AppEngine, Python, opensource, LMS), "Members" (listing email addresses and commit counts), and "Featured" (listing Wiki pages like CourseBuilderChecklist and DesignProcess). The right column features a video titled "Welcome to Course Builder!" by Peter Norvig, which shows him in front of a large Google logo. Below the video, there is a text prompt: "Checkout our new page, [Open Online Education!](#)".

Experimental Platform for Online Education at Scale

- Open edX platform
 - code.edx.org/

The screenshot shows the GitHub repository page for edX. At the top, the GitHub logo is on the left, followed by a search bar labeled "Search GitHub". To the right are links for "Explore", "Features", "Enterprise", and "Blog", along with "Sign up" and "Sign in" buttons. Below this is the repository header for "edX", featuring the edX logo and the text "Open edX is the open-source code that powers http://www.edx.org". It also includes links for "http://code.edx.org" and "info@edx.org". A "Filters" dropdown and a search bar "Find a repository..." are visible. The main content area lists two repositories: "edx-analytics-dashboard" (Python, 6 stars, 7 forks) and "edx-platform" (Python, 1,472 stars, 842 forks). Both have "Updated 3 minutes ago" and include a commit history bar chart. On the right, a "People" section shows a grid of 16 profile pictures, with a "73 >" link. A "Developer Program Member" badge is visible at the bottom right of the page.

Experimental Platform for Online Education at Scale

- openHPI
 - <https://openhpi.de>

The screenshot shows the SourceForge project page for Open HPI. At the top, there is a navigation bar with 'SOURCEFORGE' logo, a search box, and links for 'Browse', 'Enterprise', 'Blog', 'Help', and 'Jobs'. Below this is a secondary navigation bar with 'SOLUTION CENTERS', 'Go Parallel', 'Smarter IT', 'Resources', and 'Newsletters'. The main content area features a 'Go Parallel' banner with the text 'DESIGN BUILD VERIFY TUNE INSIGHTS' and 'Expert tips on starting your parallel project right.' To the right is a 'Get the Slashdot Newsletters' banner with a 'Sign up!' button. Below the banners, the breadcrumb trail reads 'Home / Browse / System Administration / Hardware / Open HPI / Files'. The project title 'Open HPI' is displayed, followed by 'Brought to you by: avpak, dr_mohan, pdphan, renierm, and 4 others'. A navigation bar contains links for 'Summary', 'Files', 'Reviews', 'Support', 'Wiki', 'Mailing Lists', 'Tickets', 'News', and 'Code'. A message asks 'Looking for the latest version? Download openhpi-3.5.0-win32-amd64.zip (4.5 MB)'. Below this is a file list table with columns for Name, Modified, Size, and Downloads / Week. The table lists three files: 'openhpi-3.5.0-win32-amd64.zip' (4.5 MB, 2 downloads), 'openhpi-3.5.0-win32-x86.zip' (4.0 MB, 2 downloads), and 'openhpi-3.5.0.tar.gz' (7.7 MB, 17 downloads). A 'Totals' row shows 3 items, 16.2 MB, and 21 downloads. On the right side, there is another 'Go Parallel' banner with the text 'Stay connected, up-to-date, and informed on all things parallel development via Go Parallel, where you'll find viewpoints, how-to's, software tools, and educational information to help your software development work shine.'

Name	Modified	Size	Downloads / Week
↑ Parent folder			
openhpi-3.5.0-win32-amd64.zip	2014-10-09	4.5 MB	2
openhpi-3.5.0-win32-x86.zip	2014-10-09	4.0 MB	2
openhpi-3.5.0.tar.gz	2014-10-09	7.7 MB	17
Totals: 3 Items		16.2 MB	21

Experimental Platform for Online Education at Scale

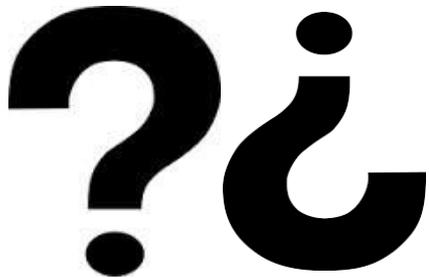
- Open MOOC
 - openmooc.org
- Outros
 - <http://www.learndash.com/5-mooc-building-platforms/>

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- [2] Armbruster, Patel, Johnson, & Weiss, 2009; Deslauriers, Schelew, & Wieman, 2011; Saville, Zinn, Neef, Van Norman, & Ferreri, 2006
- [3] Blanco, Á. F., García-Peñalvo, F. J., & Sein-Echaluce, M. (2013, November). A methodology proposal for developing adaptive cMOOC. In *Proceedings of the First International Conference on Technological Ecosystem for Enhancing Multiculturality* (pp. 553-558). ACM.

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- [5] Martin, Fred G. **Will massive open online courses change how we teach?** Communications of the ACM, v. 55, n. 8, p. 26, 2012.
- [6] Khan, Salman. **O rockstar da educação: entrevista com Salman Khan.** In.: Exame CEO, Agosto de 2011. Disponível em http://fundacaolemann.org.br/khanportugues/uploads/exame_201108.pdf. Acesso em 02 mai. 2013

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- [8] Princeton EDGE Lab. **Innovating Education with MOOC/FLIP.** Disponível em: <http://scenic.princeton.edu/files/MOOC_FLIP_thoughts.pdf> Acesso em: 13 out. 2013.

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- [9] Wood, Michael T. **Opportunities in Online Education-Staying Ahead of the Curve: The Case of the MOOC**. Council of Independent Colleges Presidents' Institute January 6, 2013. 2013. Disponível em: <http://www.cic.org/News-and-Publications/Multimedia-Library/CICConferencePresentations/2013%20Presidents%20Institute/Concurrent%20Sessions/Recent%20Developments%20in%20Online%20Education_%20Wood%20Handout.pdf>. Acesso em: 13 out. 2013.

Referências Informais

- <http://googleresearch.blogspot.com.br/2013/09/we-are-joining-open-edx-platform.html>
- <http://mooc.org/>
- <https://eliademy.com/>