

Worklearn 2016

A workshop about online learning and labor at [CHI 2016](#)

This is a living Document of the workshop. You are free to leave comments and discuss ideas before during and after the workshop. The workshop will take place in room 210F, May 8th 2016.

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Participants

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Abstract

Education is one of the eight Millennium Development Goals of the United Nations. Considerable interest has been displayed in online education at scale, a new arising concept to realize this goal. Yet connecting online education to real jobs is still a challenge. This CHI workshop bridges this gap by bringing together groups and insights from related work at HCOMP, CSCW, and Learning at Scale. The workshop aims at providing opportunities for groups not yet in the focus of online education, exemplified by students who have not have equal access to higher education, compared to typical students in MOOCs.

The focus is on theoretical and empirical connections between online education and job opportunities which can reduce the financial gap, by providing students with an income during their studies. The workshop will investigate this concept by bringing together participants from industry (e.g., platforms similar to Upwork, Amazon Mechanical Turk); education, psychology, and MOOCs (e.g., attendees of AERA, EDM, AIED, Learning at Scale); crowdsourcing and collaborative work (e.g., attendees of CHI, CSCW, NIPS, AAAI's HCOMP).

Agenda

Time

Top

9:00	Introduction (45 min) A short introduction by the organizers 2 minute presentations by participants
9: 45	Ideation (30 min) In the ideation phase we will collect possible ideas that fit the scheme of WorkLearn as a field. We want to identify what kind of project is interesting and what questions it would answer.
10:30	Coffee break
11:00	Building Blocks I Building blocks are reusable text blocks that most of the projects we are planning would need to address. For instance related work or descriptions of common methods used in the field. We will split up into different groups for this session.
12:30	Lunch
1:30	Building Blocks II Second part of the building block session. The groups will continue. We will split up into the following groups: 1) Intersection of offline employment and education 2) Challenges of connecting online work and education 3) Solutions to bridge the gap in the digital world
4:00	Coffee break
4:30	Assembly In this phase we are putting things together. The idea is to take building blocks that flesh out parts of the proposals imagined in the ideation phase.

Funding Mechanisms

Funding Body	Funding Cycle	specific dates	Notes on aims	Eligibility
IES	yearly	Aug 04	12 programmes; special topic in 2016 for Career and Technical Education (but for k-12 learners)	US Institutions + international partners
VW Computational Social Science	One shot	Jun 15	must be computationally supported social science; must have one German onboard	Germany + international partners
NSF Cyber Learning and	yearly		three levels of maturity for projects	US Institutions

Future Learning Technologies				
NSF Citizen Science and Crowdsourcing	one shot	Jun 01	(EAGER concentration)	US Institutions
NSF Advanced Technological Education	yearly		concentration on technical education	US Institutions
H2020 FET grants	bi annual		open concentration; ~1% accept rate	EU Institutions + international partners
ERC Starting Independent Researcher Grants	yearly		open concentration	EU Institutions + international partners
Ford Foundation	open		"Challenging Inequality"	US Institutions
Lumina Foundation			populations not traditionally well-served by education	US Institutions
H2020 Erasmus+ grants	bi annual		http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2015.347.01.0007.01.ENG	EU Institutions
Next Generation Learning Challenges	yearly	March	http://nextgenlearning.org/grants	US Institutions
MIT IDE Inclusion Innovation	yearly	Jun 15	reskilling employees; opening economic opportunities for all	International
McArthur Foundation	One shot	Mar 13	Digital Media and Learning	International
Spencer Foundation	yearly	Jul 12	instructional practice, educational infrastructure, and research infrastructure	US Institutions

Ideas

Every idea has a title (working titles are OK! ;)) and a coordinator. The coordinator keeps track of who submitted proposals to which funding organization to prevent overlap. It is absolutely fine to submit the same idea to different funding agencies but it is important to know who else is researching the idea (collaboration, citation, etc.). The coordinator updates the proposals section. It should contain the funding agency and the person to contact for the proposal.

(The following is an example for a idea in this document)

Moocita: Peer reviewed homework assignments become credentials for online labor markets

Coordinator:

Markus public.markus.krause@gmail.com

Abstract:

Education is one of the eight Millennium Development Goals of the United Nations. With interest in online education at scale, new concepts arise to realize this goal. However, students who could benefit the most need more than just online learning material. People in rural areas of developing countries for instance may not have the financial stability to pursue their education online. The proposal aims at providing monetary independence for learners in online education, applying an old concept to a new medium: the apprenticeship. The rise of online work platforms such as *UpWork* and *witmart* already show the potential of high quality online work.

Used Building blocks:

None so far ...

Proposals submitted to:

DFG ([German Research Foundation](#)),

Markus public.markus.krause@gmail.com

EU ([FET Open - European Commission](#)),

Markus public.markus.krause@gmail.com

Building Blocks

A building block consists of a prior research section that summarizes related work in an area. It gives a set of relevant references for each summarized research direction in the area. Most important the building block also summarizes the open questions in the area.

Each building block should have a descriptive title to make it easy to find it, the text, and a list of references used in the text. Please attach the references also to the Library section! This is redundant but helps people looking for references.

Intersection of Offline Employment and Education

Describe the offline labor market and offline educational systems. What can we learn from comparing online solutions of today to ideas from around for several decades?

Some example questions:

- How universities do provide trusted credentials?
- How do universities establish credibility for work experience?
- How do they motivate students?

Describe their challenges

- How do they establish trust in students (that their degree helps them get a job)?
 - Intrinsic
 - Extrinsic (not so much?)
- How do they establish trust in employers (that the degree can predict performance)?
 - There is no alternative
 - By slow built and rapidly lost reputation! (Brand management)
 - Has GE influenced the EECS curriculum?
 - Are there preferred hiring policies? What metrics/qualitative indicators that are used?
- How do they deal with fraud?
 - People are usually good in person
 - turnitin
- How do they deal with identity?
 - Social identity!

Describe their solution to these challenges.

Current labor market

- Resume/CV
 - Reputation of universities (+transcripts)

- Internships (similar to work experience)
- Other achievements (completions, awards, etc.)
- Portfolios
- “Looking good” at a job interview
- University – industry connections/agreements/placement
- Assessment center
 - In the UK, e.g., test of collaborative skills and soft skills as well, beyond technical
- Campus placement: companies that come to campus for interview

External recruiters – match-making process

- If there is a need and place for third parties to be involved, does this mean the process isn't perfect?

Some references:

The validity of employment interviews: A comprehensive review and meta-analysis.
 McDaniel, Michael A.; Whetzel, Deborah L.; Schmidt, Frank L.; Maurer, Steven D.
 Journal of Applied Psychology, Vol 79(4), Aug 1994, 599-616.
<http://dx.doi.org/10.1037/0021-9010.79.4.599>

Coplin, William D. *10 things employers want you to learn in college: The know-how you need to succeed*. Springer Science & Business, 2003.

Selena Larson. Can An Online Education Actually Land You A Job? *readwrite*.
 Retrieved January 12, 2016 from
<http://readwrite.com/2013/12/13/mooc-online-education-jobs>

Decision of which students to hire

Hiring decisions are often based on the reputation of a university, a social network and their reputation, or a relationship between a university and a company.

University names matter, but so do the specific departments and reputations, as well as the names of degrees. Some companies also hire students based on internship or coop performance that occur during the university time period.

- Question: How are these reputations/relationships formed?
 - Possibly surveys and rankings like
 - Employer perspective:
<http://www.topuniversities.com/student-info/careers-advice/best-universities-according-employers> and
 - Student perspective:
<http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/national-universities>

- Question: Do companies influence curricula to their advantage?

On-the-job training

- Internships and co-ops: companies hire students as a training and evaluation period
- Training: Employees hired into a company often undergo a training period, which can be short or extensive (such as 1-year rotation training programs) depending on the company and career.
 - For example:
 - <http://www.ge.com/careers/culture/university-students/early-career>
- Mentorships/hierarchies: During these time periods, the employees are trained specific to that company. Beyond that training period, employees start at a level based on their experience and have the ability to work toward higher positions. Lower-level employees often have managers overseeing them who provide feedback and guidance. They can also have mentors in an un-official sense either within their company or externally.
 - Marginal mentoring: the effects of type of mentor, quality of relationship, and program design on work and career attitudes
 - <http://prod-web.oit.uwplatt.edu/files/tlc/Mentoring/Mentorig%20Program%20Outcomes.pdf>
- Official education: many companies will pay for additional education, such as MBAs or master's programs.
 - For example:
 - <http://www.boeing.com/careers/life-at-boeing/building-leaders.page>
- Continuing Education Unit: A national standard for the work-learn-bridge activity
 - <http://www.iacet.org/ceus/about-the-ceu>
 - (TODO) Lit survey on the usage and effectiveness of the CEU

Traditional classroom flexibility/adaptability

- The physical state of classroom learning enables teachers to understand more about students based on things like attention, interest. Teachers can then adapt the lessons, curriculum, assignments, and exams if students seem more confused or seem like they already understand.
 - High bandwidth feedback for both teachers and students

Going beyond deadlines: creating habits and routines to increase commitment and engagement

- **Deadlines are motivating** (extrinsic, though the guilt and conscience and the sense of responsibility it induces might be intrinsic)

- Activity peaks during deadlines
- Most significant innovation in online education recently is the enforcement of deadlines (Norvig, personal communication)
 - Also from Peter Norvig's TED talk: So we brought back the innovation of having due dates. (Laughter) You could watch the videos any time you wanted during the week, but at the end of the week, you had to get the homework done. This motivated the students to keep going, and it also meant that everybody was working on the same thing at the same time, so if you went into a discussion forum, you could get an answer from a peer within minutes.

https://www.ted.com/talks/peter_norvig_the_100_000_student_classroom
- While lack of routine is offered as a feature, it might not be
 - Why in the hell will a twelve year old spend an hour every Tuesday morning studying Geography?
- Routines and habits are stronger sources of motivation for repetitive tasks
 - Psychological evidence
 - Offline education and work relies on it heavily (the 9 to 5, the weekly team meeting, regular course meetings)
- **How can we increase routine/habit in online education?**
 - *Scaling guilt for increasing efficacy of online education*

Going beyond facebook friends: finding deep and long-lasting relationships

- **Meaningful human connections are motivating** (intrinsic)
 - A significant fraction of students find friendship, love, mentorship and more in offline education
 - Long-term stable cohorts over years/decades
 - In-person meetups helpful in increasing success in MOOCs
 - LOOC (local open online course)
 - What can we learn from deep online communities, e.g., PatientsLikeMe?
- Deep relationships teach highly valuable skills (to employers as well)
 - Social accountability
 - Responsibility
 - Reputation

Going beyond jobs: curriculums for career

- Offline education is strong in teaching long-lasting conceptual skills
 - E.g., calculus, comprehension, communication
- Online education is weak in these, as they require higher intrinsic motivation.

- How can online education train for the next decade, not the next year?

Finding yourself: a safe environment for developing your persona and passions

Challenges Connecting Online Work and (Online) Education

Are there any solutions that do not exist offline but exist digitally?

Digital: social media (LinkedIn, Company job posts), online career fair(c

- There's a difference between program and course... that we be cognizant of... thinking about degree vs credential?
- Some of the current literature says that moocs are breaking down the degree into micro units... (Certificate oriented) vs. distance education program (institution endorsed diploma/degree program) - acknowledgement - bachelor degree
- Currently in some online work situations previously earned credentials/degrees are used as signals of worker quality, whereas the brand is the signal of quality on the requester side.
- How to give the freelancer working experiences credits of learning (by doing)
- Continuous enrollment... vs cohort-based offline

Are there any solutions exclusively used offline?

Most of the solutions are blended.

Career counselling services, administrative work offline organized by institution (school/industry company) are not oriented towards online

How does the individual components differ from their offline counterpart?

- pedagogy: "connectivism" is purely online pedagogy (Stephen Downes & George Siemens)
- autonomous learning or self-directed learning in education (Moore 1993-transactional distance theory)
- the analogous strategies offline may be no longer an ideal option for online to maximize the possible affordances online
- self-presentation (Goffman) beyond being there (hidden and disclosure part)

(lit for many of the points above can be found in this article:) MOOCs and Crowdsourcing: Massive Courses and Massive Resources

<http://firstmonday.org/ojs/index.php/fm/article/view/6143>

Learning online vs. offline

- Learners online resides on their autonomy (Community of inquiries, Garrison et al 2009; Anderson)
- Instructors are hard to chase them (remotely, hard to track or contact),
- Synchronous vs asynchronous communication (needs, problems, feedbacks)
- Online learning provides flexibility, choose your own timeline
- Time zones are more of an acknowledged fact, widely accepted and expected online
- For instructors, online environment could provide more evidential tracking and view incremental progress as the class go (recorded archiving functions online)
- Deliverable through verbal in FtF vs Online through writing makes a difference on the depth of learning and critical thinking process
- Learning in group:
 - a. division of labour, is it collaboration or not?
 - b. Coordinator vs leader

Online labor vs. offline

- There's always exchange involved, generally time/skill for money, usually organized in some sort "market" format.
- Discrepancy about unemployment balance (demand vs supply) between online and offline
- What fraction of total labour is online labour? Is online labour growing?
 - Will offline labor move to online, or, new kinds of work entirely constitute the new online labor?

Credentials online vs. offline

- Badges, gamification [online] (does extrinsic motivation (ie badge) crowd-out intrinsic motivation

Gamrat, C., Zimmerman, H. T., Dudek, J., & Peck, K. (2014). Personalized workplace learning: An exploratory study on digital badging within a teacher professional development program. *British journal of educational technology*, 45(6), 1136-1148.

Steering User Behavior with Badges:

<https://www.cs.cornell.edu/home/kleinber/www13-badges.pdf>

Anti-badge, voting-down (Klein, Mark; Garcia, Ana Cristina Bicharra (2015): High-speed idea filtering with the bag of lemons. In: *Decision Support Systems* 78, S. 39–50. DOI:

10.1016/j.dss.2015.06.005.)

- Peer review - intermediate step to credentials [online] Poetz, Marion K.; Schreier, Martin (2012): The Value of Crowdsourcing. Can Users Really Compete with Professionals in Generating New Product Ideas? In: *J Prod Innov Manag* 29 (2), S. 245–256. DOI: 10.1111/j.1540-5885.2011.00893.x.
 - Certifications from university/institutions (both)
 - Certifications from training programs (both)
 - Time-banking (time can be the currency for trading and peer production)
 - There seem to be no mentor structures with online (except Udacity), group dynamics can fulfill part of mentor roles
Paper from michael bernstein on “Atelier: Repurposing Expert Crowdsourcing Tasks as Micro-internships”. CHI 2016
 - Kulkarni, A., Gutheim, P., Narula, P., Rolnitzky, D., Parikh, T., & Hartmann, B. (2012). Mobileworks: Designing for quality in a managed crowdsourcing architecture. *Internet Computing, IEEE*, 16(5), 28-35.
 - For some active learners, they can be hired in the future as returned employee (mentor, graders etc) [Udacity]
 - Group size in offline, usually no more than 5, online? Limit by the dunbar number ie 150? In other words because of the massive size of students in a group, so we maybe limit or encourage the fragmentation/self organization of groups. Perhaps self organize on other networks like Facebook.
 - David Karger’s work on splitting fora into multiple instances for improving conversation (NB project at MIT)
 - NovoEd is a MOOC that focuses on group-based learning. Typically groups are small, but there isn’t (or at least wasn’t) an infrastructure to enforce people work actively with their group members.
 - Groups vs division of labour?
 - Self-sorting at registration doesn’t really happen in online, but certainly can online. An incoming matriculation score?
 - Zheng, S. et al., 2015. Understanding Student Motivation , Behaviors , and Perceptions in MOOCs. , pp.1882–1895.
 - Honour codes? Letter of recommendations usually indicate soft skills
 - Online proctoring (novoed)
 - bi -directional gamification scales, ie up and down (vote down)
- Crowd Credentials: How do you document/certify work that crowdworkers have done and skills they have obtained?
 - Documenting all tasks that workers have done and aggregating them into skills (using NLP or machine learning).
 - Peer validation
 - Displaying skills to workers to show what they learned/what skills they know

- Making recommendations for what work they can do, what platforms they should work on, what skills they should learn.
- Crowd work as credentialization. Requesters can authorize you've done meaningful work in an area and have the necessary skills to get better jobs.
- Microtask available, send us your CV!
http://www.mthimm.de/pub/2013/Sarasua_2013.pdf
- Work on training crowd workers for complex problem solving tasks (could lead to a crowd work career trajectory from small tasks to more and more complex and specialized tasks):
<http://www.cs.cmu.edu/~shayand/CHI2016.pdf>
- Personalization based on entrance survey to MOOCs (and crowdsourcing platforms?)
 - Ask students what their goal is (certificate, browsing)
 - whether they want to work alone, in groups, in pairs
 - whether they like discussion forums
 - which units they're interested in completing (can lead to more accurate measures of drop out rates)
 - Then personalize based on all of these features (choose which features to provide each students)
 - Should not presume why people are taking MOOCs OR why people are doing crowdsourcing jobs/online work.

Bridging the Gap in the Digital World

Are there opportunities beyond what is already possible with adapting offline solutions? What do we need to manufacture work experience better in the online world?

Credentials

- How to solve the chicken and egg problem in a digital world.
- How to establish trust for these methods
 - Establish trust in students
 - Establish trust in requesters

Fraud

- Protect against plagiarism
- Protect against authentication

Self credentialing: Integrating learning activities & work tasks (Joseph)

Block:

Problem:

How can online learners take independent action to obtain credentials or recognizable credit for what they know?

Obstacles:

- > Hard to obtain well-respected credentials through your own online activity, without the blessing of a **formal institution** like a university (providing degree) or employer (references, proof you've held a position).
- > Most learning activities are far-removed from genuine work activities. They're created by instructors who do not directly consider actual work activities, those 'come later'.

Potential Solutions:

>Volunteering for Credentials: Making Your Completed Work Available so that "employers" can discover it and hire you:

> Websites that provides repositories or "go-to" places for portfolios:

Designers can submit and showcase their work: www.behance.net and dribbble.com

> Making Learning Activities involve Real Work (rather than just activities the instructor creates)

> Udacity designs courses and [Nanodegrees](#) so that students do projects that build products for their portfolio.

Udacity lets students have a [profile](#) on their account to showcase work.

Udacity gives students advice for how to turn their "course projects" into [portfolio components to be hired by specific companies](#).

> Mixing Tutorials with Micro-Work from "real employers". Dontcheva et al modified Adobe Photoshop tutorials so that learners would practice their skills by editing *actual* images that "requesters" would submit.

[Combining crowdsourcing and learning to improve engagement and performance](#)

Reference:

From rookie to all-star: professional development in a graphic design social networking site

<http://dl.acm.org/citation.cfm?id=2531651>

Combining crowdsourcing and learning to improve engagement and performance

<http://dl.acm.org/citation.cfm?id=2557217>

Employers and credential perception (Eureka)

Block: How deep do requesters look into credentials? What are they looking for? What do employers look for and pay attention to in making hiring decisions?

- Employers now use social networking sites to gather data on applicants. What prompted this change?
- What does human capital theory and signalling theory have to do with this problem?

Examples: N/A

References: Jonathan Adams & Margaret H. Defleur (2006) The Acceptability of Online Degrees Earned as a Credential for Obtaining Employment, *Communication Education*, 55:1, 32-45, DOI: 10.1080/03634520500343376

Brown, V. R., & Vaughn, E. D. (2011). The writing on the (Facebook) wall: The use of social networking sites in hiring decisions. *Journal of Business and psychology*, 26(2), 219-225.

Keywords: online degrees, higher education, virtual college, hiring, perceptions, academic degree programs, adult education, transparency, "Need to defend the value of your degree", human capital theory ("any difference in the ability to be hired and the level of subsequent earnings are reflective of the difference in the amount of human capital that an individual possesses", as cited in [Bartlett \(2012\)](#)), prescreening, personnel selection

Notes:

Takeaway: It seems like employers equate an online degree with less rigor and a lack of "traditional learning methods"; even if we improve the credentials, we may not solve the entire problem. Transparency of the work that is done to earn an online degree may be a direction for future research.

- Columbaro & Monaghan (2008): In their literature review, empirical research found that employers were much more likely to report wanting to hire candidates with traditional vs. online degrees. Many of these were surveys, so they were hypothetical situations. However, a review of popular articles provides anecdotal evidence that there can be positive experiences with employees with online degrees.
- Columbaro & Monaghan (2008):

- “Throughout the literature, potential employers cited the following reasons for their reticence in accepting online degree credentials:
 - lack of rigor
 - lack of face-to-face interactions
 - increased potential for academic dishonesty
 - association with diploma mills
 - concerns about online students’ true commitment evident from regularly venturing to a college or university physical location, which some consider to be an important part of the educational experience.”
- Columbaro & Monaghan (2008) propose a few conditions that could influence acceptance of online degrees, but note more rigorous research is needed.
- Adams and Defleur (2006): In a survey of hiring executives in the U.S., researchers found that participants were significantly more likely to recommend hiring an applicant with a traditional rather than a partial or completely online degree. In their comments, participants highlighted the importance of “traditional learning methods” (e.g. interaction, role play, quizzing), that are absent in a “sterile” internet learning environment.

Hard to credentialize tasks

Block: Various skills are very hard to estimate especially in online environments. Research in this area has been done by the open badge initiative [1]. However it is complex to credential these skills in online as well as offline courses. This becomes more important if the skills are applied in private situations for instance helping friends organizing events, etc. Online credential systems might help to collect information about these soft skills. An example could be to predict how well a person fits a team which highly depends on a person's soft skills. Salas et. al [2] argues that teamwork can be divided into five core components the “Big Five” in teamwork including team leadership, mutual performance monitoring, backup behavior, adaptability, and team orientation. Still an open challenge is how to predict these personality types in students at scale. Research has shown that it is possible to detect personality traits from writing samples [3]. Yet there is no research that shows that these automatically extracted personality traits can yield better group building.

Writing and personality:

Hall M, Caton S. A Crowdsourcing Approach to Identify Common Method Bias and Self-representation. IPP2014: Crowdsourcing for Politics and Policy. Oxford, England; 2014.

Examples:

<http://openbadges.org/>

Reference:

[1] Open Badges: Challenges and Opportunities;

http://link.springer.com/chapter/10.1007/978-3-319-09635-3_6

[2] EDUARDO SALAS DANA E. SIMS C. SHAWN BURKE; IS THERE A “BIG FIVE” IN TEAMWORK?

[3] Personality, Gender, and Age in the Language of Social Media: The Open-Vocabulary Approach

Keywords: soft skills (e.g. presenting, writing, teaching), social skills

How it's currently being done: Highlighted in recommendation letters

Constraints: Needs to work across many contexts

- *Erving Goffman talks about the concept of “make-work” in his theory of self-presentation: how individuals exert effort to display mostly invisible work processes.*

<http://www.amazon.com/Presentation-Self-Everyday-Life/dp/0385094027>

Certificates why are they accepted and online degrees not?

Block: why are technical certificates perceived highly by employers and not MOOCs? Branding issues surrounding this?

“Learners can be assessed on time-on-task; learner course component interaction; and a certification of the specific skills and knowledge gained from a MOOC.” [3]

*“Certifications act as a **signal** to hiring managers that a job candidate has achieved a level of knowledge and skill necessary to perform in a particular job role.”*

Examples: Microsoft/Cisco versus Udacity/Coursera

Reference:

[1] “The Perceived Influence of Industry-Sponsored Credentials in the Information Technology Industry”, 2002,

<http://files.eric.ed.gov/fulltext/ED465072.pdf>

[2] “Who Needs Certifications? A Survey of Certifications in the IT Industry”, 2013,

<http://proc.isecon.org/2013/pdf/2539.pdf>

[3] “Massive Open Online Courses (MOOCS): Emerging Trends in Assessment and Accreditation”, 2014,

<http://files.eric.ed.gov/fulltext/EJ1039698.pdf>

[4] "Industry certification and academic degrees: complementary, or poles apart?", 2007, <http://dl.acm.org/citation.cfm?id=1235023>

[5] Employer Perceptions of Online Degrees: A Literature Review
<http://newprairiepress.org/cgi/viewcontent.cgi?article=2898&context=aerc>

Person: Jay Rainey -- jawrainey@gmail.com

Keywords: Signalling theory

<http://hbx.hbs.edu/hbx-core>

Successful & Well Recognized Distance Learning Universities (Credentialed):

Highly Recommend this overview book by Jeff Selingo: [College \(Un\)bound: The Future of Higher Education and What It Means for Students](#)

<https://asuonline.asu.edu/student-resources/faq>

https://en.wikipedia.org/wiki/Western_Governors_University

Perception of Fraud and Plagiarism

Block: Automated plagiarism can be split into two main categories intrinsic and extrinsic. Intrinsic plagiarism detection does not use a reference corpus. It uses stylistic changes or inconsistencies within a given document or set of documents [1]. Extrinsic plagiarism as offered by various companies such as grammarly and turnitin compares documents with entries in a database to identify parts that are similar. Especially extrinsic plagiarism detection was intensively explored in the past [2, 3, 4, 5]. The proposed methods work for natural languages [2] as well as coding languages [3].

Examples:

www.grammarly.com

www.turnitin.com

Reference:

[1] Intrinsic plagiarism detection;

http://link.springer.com/chapter/10.1007%2F11735106_66

[2] CHECK: a document plagiarism detection system

[3] Faidhi, J. A., and Robinson, S. K. An empirical approach for detecting program similarity and plagiarism within a university programming environment. *Computers & Education* 11, 1 (1987), 11–19.

[4] Computer-based plagiarism detection methods and tools: an overview;

[5] Flores, E., Rosso, P., Moreno, L., and Villatoro-Tello, E. PAN@FIRE: Overview of SOCO Track on the Detection of SOURCE CODE Re-use. In *Sixth Forum for Information Retrieval Evaluation* (2014)

Using Multiple Accounts for Harvesting Solutions in MOOCs by Jose A. Ruiperez-Valiente, Giora Alexandron, Zhongzhou Chen, David E. Pritchard

Person: Markus (public.markus.krause@gmail.com)

Automated tutoring systems

Automated tutoring systems are excessively researched

[1] The automated tutoring of introductory computer programming

[2]<http://www.wsj.com/articles/if-your-teacher-sounds-like-a-robot-you-might-be-on-to-something-1462546621>

Tons of prior work on intelligent tutoring systems:

https://en.wikipedia.org/wiki/Intelligent_tutoring_system

<https://www.carnegielearning.com/>

Kurt Van Lehn, [The Behavior of Tutoring Systems](#)

Typically these systems are for particular domains (e.g. teaching algebra, fractions, or writing)

Two way trust problem

Apprenticeship

Graduate schemes (UK)

Job opportunity for 1-2 two years post undergraduate. To secure a position you must demonstrate interpersonal skills, which are verified through resume/CV & in-person interview. Mentioned as this relates to *what* employers want.

Examples:

<https://targetjobs.co.uk/graduate-schemes>

Question: The economics of internship and apprenticeship? If internships are economically positive transactions, then why are not there ten times as many?

The Library

Interesting documents one might be interested to read in a quiet moment.

<http://www.sciencemag.org/content/350/6265/1245.full.pdf>

[Assessing 21st Century Skills](#): National Research Council Workshop

Successful & Well Recognized Distance Learning Universities (Credentialed):

Highly Recommend this overview book by Jeff Selingo: [College \(Un\)bound: The Future of Higher Education and What It Means for Students](#)

<https://asuonline.asu.edu/student-resources/faq>

https://en.wikipedia.org/wiki/Western_Governors_University

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https://en.wikipedia.org/wiki/Western_Governors_University

https://en.wikipedia.org/wiki/Assessment_centre Assessment Centre originating in UK/Europe a process for screening people.

<https://targetjobs.co.uk/graduate-schemes> Graduate Scheme

Whiteboard notes

- Career (trajectory) vs job
- Learning is my job
- New ways to credential people/students
- Social translator for tasks
- New opportunities: mixing crowd systems
- Distance education:
 - Job -> learning
 - Learning -> job
- Guilds and community
- Self designed curriculum