

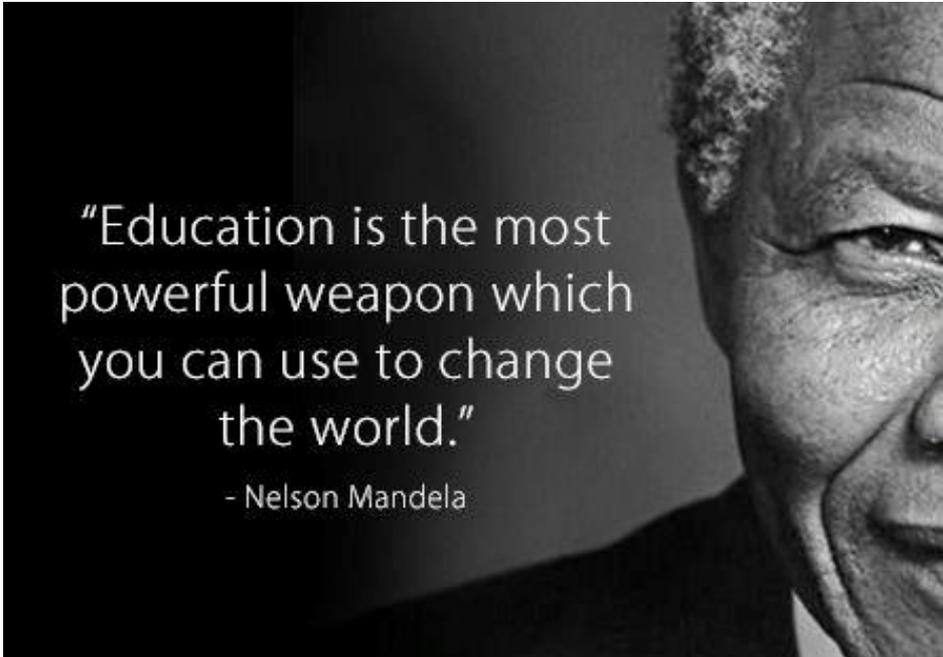
# CHALLENGE BASED LEARNING

## .... and LEARNING FOR CHANGE

19 augusti 2020

KEY NOTE PRESENTATION

**CECILIA  
CHRISTERSSON**



"Education is the most powerful weapon which you can use to change the world."

- Nelson Mandela



**LÄRARLÄRDOM 2020**

Breddat deltagande och utmaningsbaserat lärande

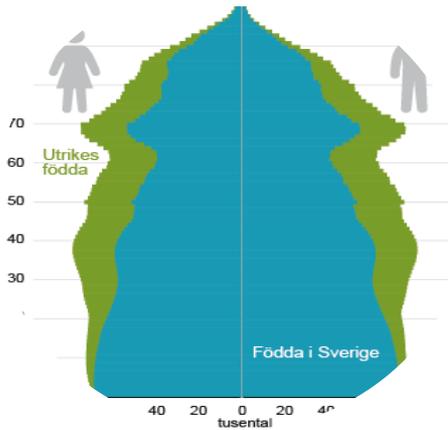
# OUTLINE



- **Challenges for Higher Education**
- **The Role of Higher Education in Society**
- **Learning theories and an epistemological shift**
- **Challenge Based Learning concepts**
- **Challenge Based Learning at Malmö University**



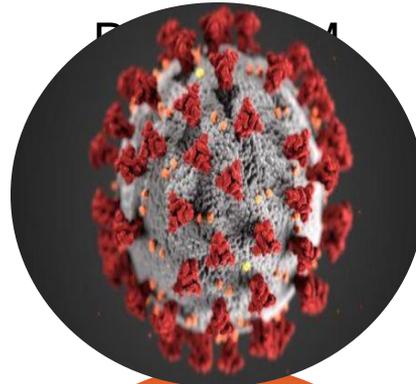
# CHALLENGES FOR HIGHER EDUCATION



DEMOGRAPHY



MIGRATION



GIG-ECONOMY



GLOBAL LEARNING  
GLOBAL COMPETENCE



AI and DIGITIZATION



Martha Nussbaum

The purpose of higher education is

*"a cultivation of the whole human being for the functions of citizenship and life generally".*

**"Our campuses are producing Citizens, and this means we must ask what a good citizen of the present day *should be and should know*"**

*Cultivating Humanity. A classical defense of reform in liberal education (1997)*



**The Civic University**  
operates on a global scale  
but uses its location  
to form its identity.

John Goddard

# LEARNING FOR CHANGE

We are supposed to prepare students for handling situations in the future.

These future situations are more or less unknown.

**We have to prepare them for the unknown, by means of the known...**

*Bowden J, Marton F. The University of Learning 1998*



# ABOUT SCIENTIFIC INFORMATION

The half-life of scientific information in nature sciences is about 5 years

Thus 50% of what we have learnt alternatively taught in a 5-year curriculum will not be up-to-date at graduation

Unfortunately we do not know which half!

# LIFE LONG LEARNING = CONTINUOUS LEARNING THROUGHOUT LIFE

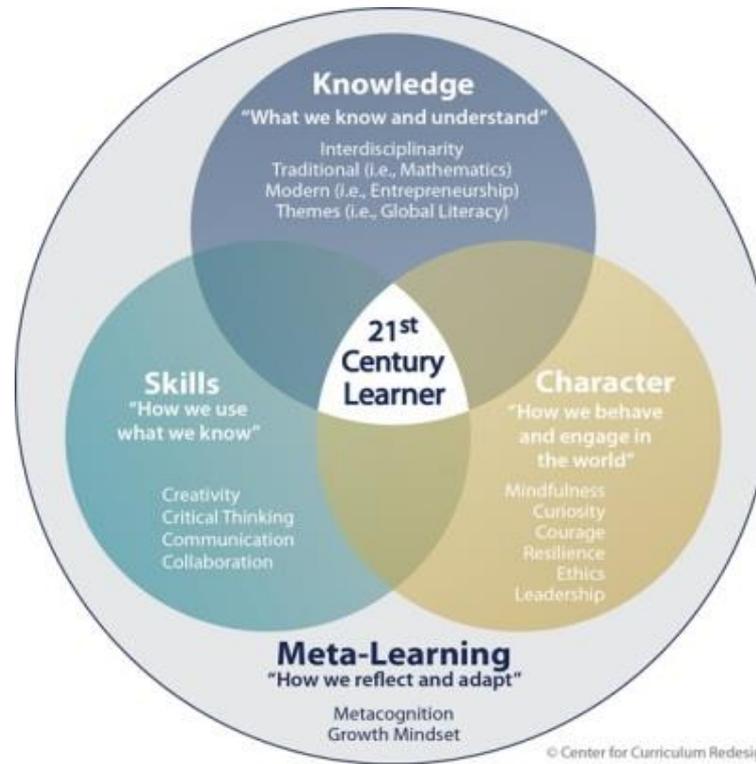


# A CALL FOR AN EPISTEMOLOGICAL SHIFT

## – reframing the nature of learning and teaching

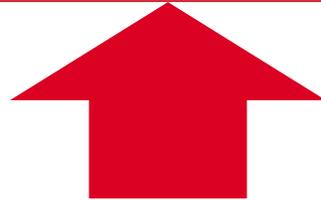
- What students *do* with knowledge: From mastery of content and skills to *using* knowledge and skills for a *readiness to act in society*
- From reproduction to construction, reconstruction and co-creation of knowledge - *knowledge for change in a learning society*
- Learning from and through experiences to construct meaning & address real-world problems – *learning for change to improve society – act as change agents / change makers*

# THE 21st CENTURY LEARNER



## Target 4.7:

By 2030, ensure that ***all learners*** acquire the knowledge and skills needed to promote sustainable development, including, among others, through ***education for sustainable development and sustainable lifestyles***, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development



## Global competency for an inclusive world



## Global Competence is

- the capacity to analyse global and intercultural issues critically and from multiple perspectives.
- to understand how differences affect perceptions, judgments, and ideas of self and others.
- to engage in open, appropriate and effective interactions with others from different backgrounds on the basis of a shared respect for human dignity.



# CHALLENGE BASED LEARNING





## Challenge Based Learning

Take action and make a difference



### The Framework

Big Idea

Essential Question

The Challenge

Guiding questions

Guiding activities

Guiding resources:  
Web and iTunes U

Solution—Action

Assessment

Publishing: student samples

Publishing: student observation

#### Citation

Nichols, Mark H., Cator, Karen (2008), Challenge Based Learning White Paper. Cupertino, California: Apple, Inc.



# Challenge Based Learning

## A Classroom Guide

*Challenge Based Learning is a collaborative learning experience in which teachers and students work together to learn about compelling issues, propose solutions to real problems, and take action. The approach asks students to reflect on their learning and the impact of their actions and publish their solutions to a worldwide audience.*

**2009**



## A CHALLENGE – BASED LEARNING EXPERIENCE (Chalmers)

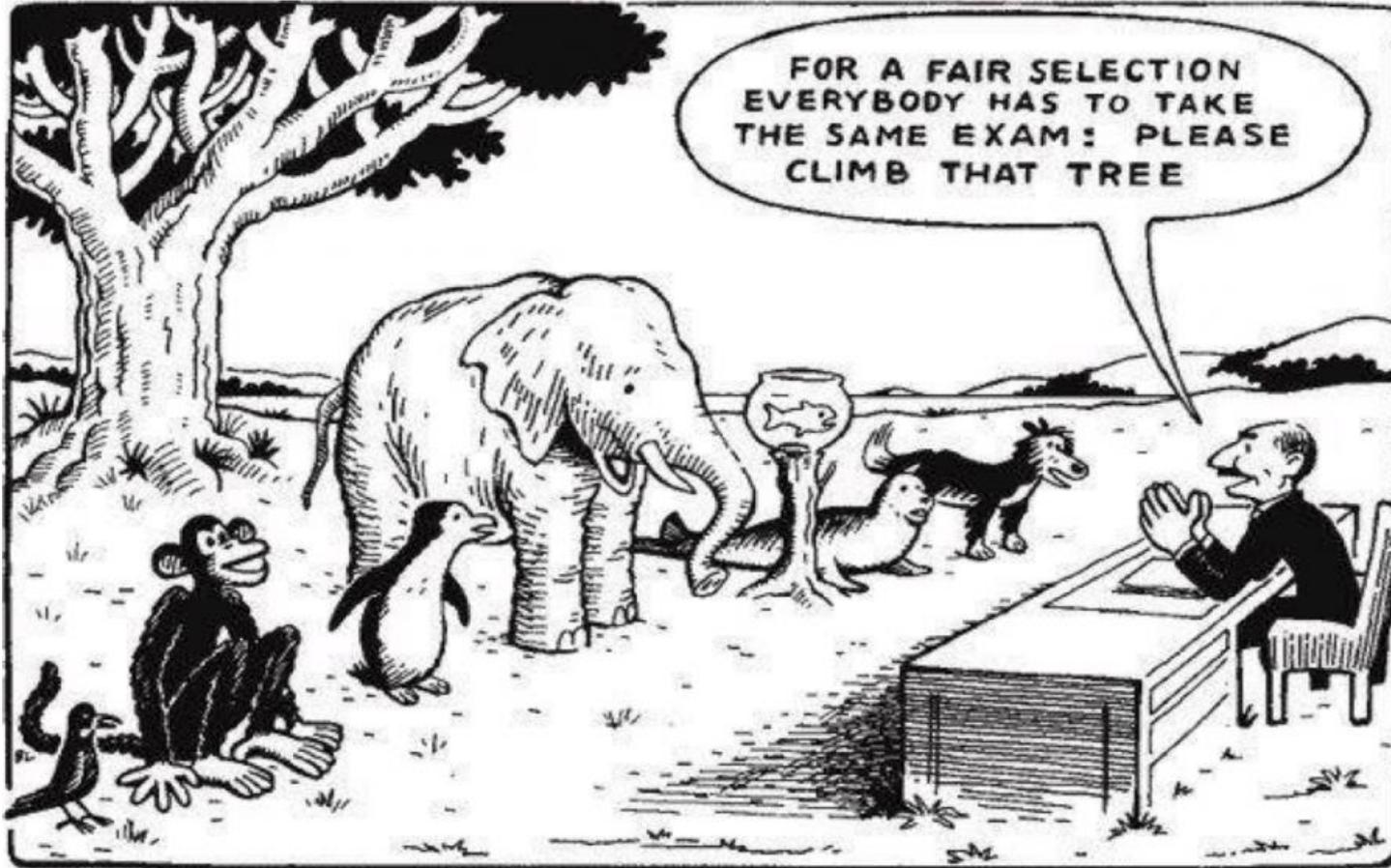
A challenge-based learning experience is a learning experience where the learning takes place through the identification, analysis and design of a solution to a sociotechnical problem.

The learning experience is typically multidisciplinary, takes place in an international context and aims to find a collaboratively developed solution, which is environmentally, socially and economically sustainable.

*(Malmqvist J, Kohn Rådberg K, Lundqvist U, 2015)*



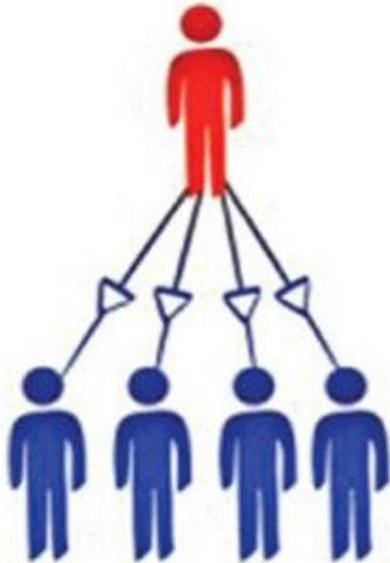
# INCLUSIVE EDUCATION? Learning for all?



"Everybody is a genius. But if you judge a fish on its ability to climb a tree, it will spend the rest of its life thinking it is an idiot."

Albert Einstein

# PEDAGOGY

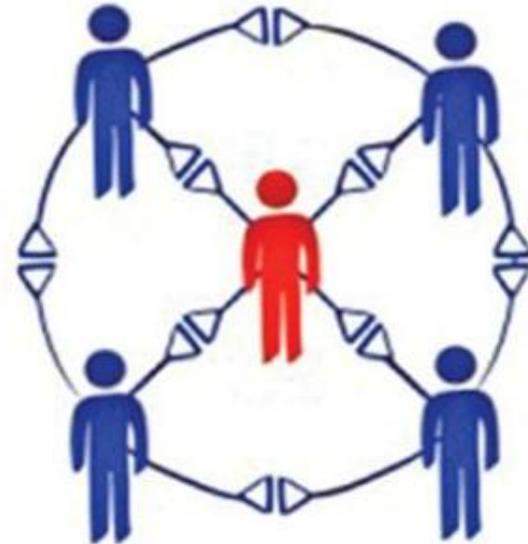


*Greek: "To lead a child....."*

*Method and practise of teaching*

*Theories of learning*

# ANDRAGOGY



Alexander Kapp  
Malcolm Knowles

*Greek: "Leading man..."*

*Theory and practice of lifelong education of adults*

*Motivation of adult learning*

# BLOOM's TAXONOMY – 3 DIMENSIONS

Cognitive



Characterization  
by Value Set

Organization

Valuing

Responding

Receiving

Affective

Psychomotor



***LEARNING  
THEORIES ...***



# MAIN THEORIES OF LEARNING

**SOCIAL & CONTEXTUAL**

*Learning from and together with others*

**EXPERIENTIALISM**

*Learning is through transformation of experiences*

**CONSTRUCTIVISM**

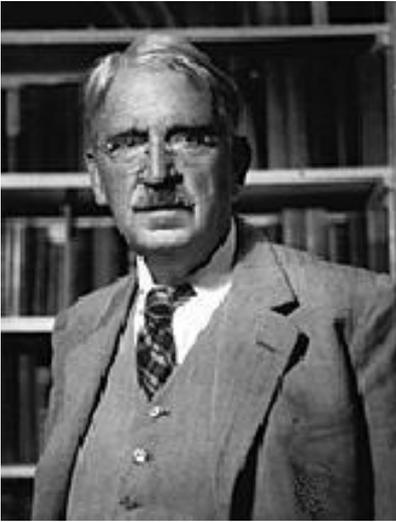
*Learning is personal construct of meaning*

**COGNITIVISM**

*Learning is individual mental processes*

**BEHAVIOURISM**

*Learning is change in behaviour through reinforcement (stimuli)*



**John Dewey**  
(1859 – 1952)

# EXPERIENTIAL LEARNING

"Learning by doing"

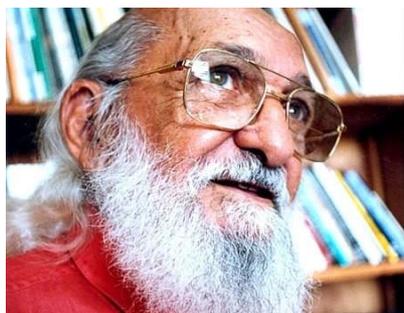


"Learn to do by knowing and to know by doing"

Dewey makes a strong case for the importance of education not only as a place to gain content knowledge, but also as a place *to learn how to live*.

In his eyes, the purpose of education should not revolve around the acquisition of a pre-determined set of skills, but rather *the realization of one's full potential and the ability to use those skills for the greater good*.

"If we teach today's students as we taught yesterday's – we rob them of tomorrow"



**Paulo Freire**  
(1921-1997)

## INCLUSIVE LEARNING

An approach to education that aims to *transform oppressive structures* by engaging people who have been marginalized and dehumanized and drawing on what they already know.

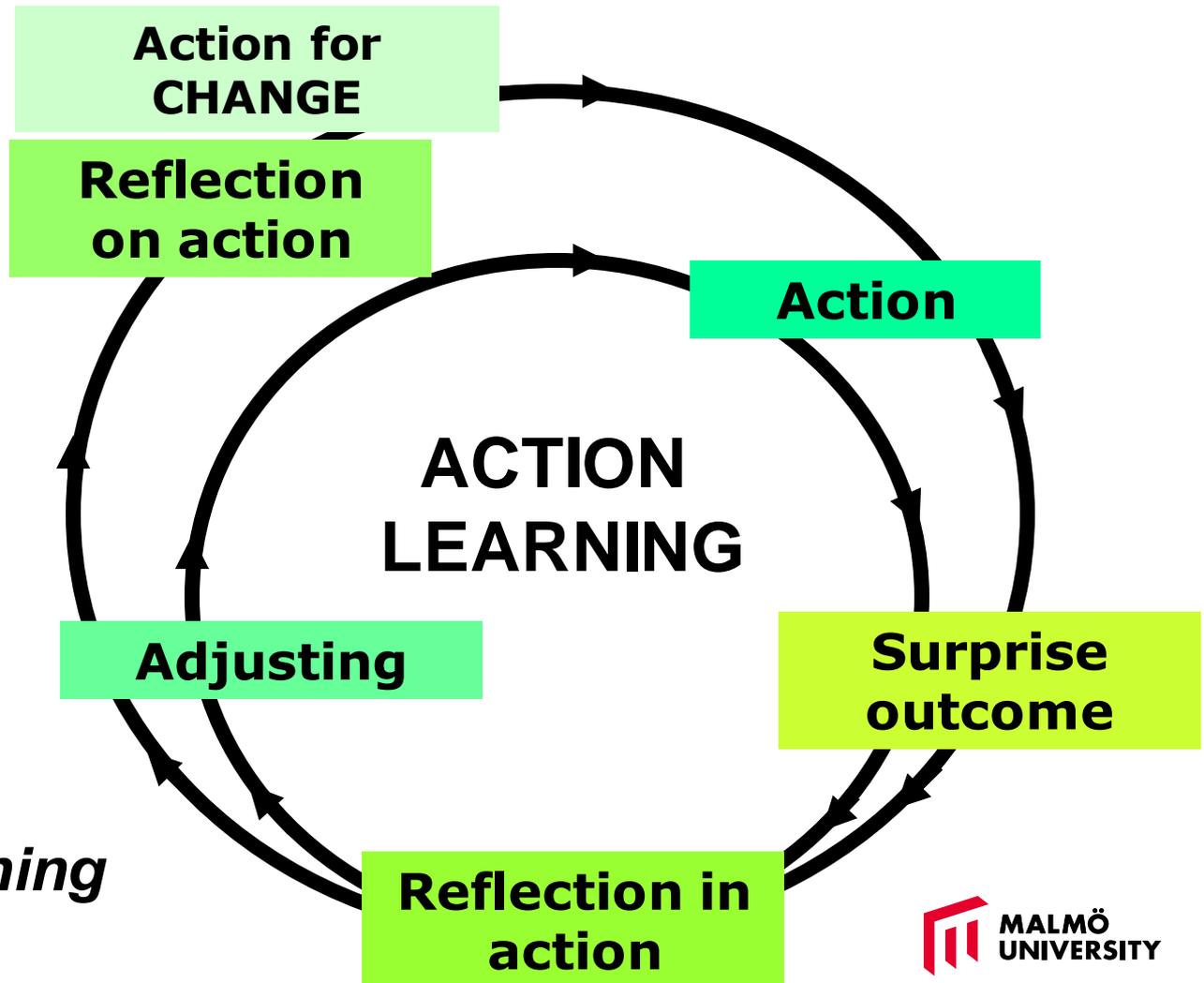
**”Critical pedagogy** is not a method, rather it opens *a space for students to act and assert themselves as agents*, question their assumptions, develop an appreciation for history and critically interrogate the idea that education is a value-neutral enterprise.”

*Pedagogy of the Oppressed (1968)*



**Donald Schön**  
(1930 – 1997)

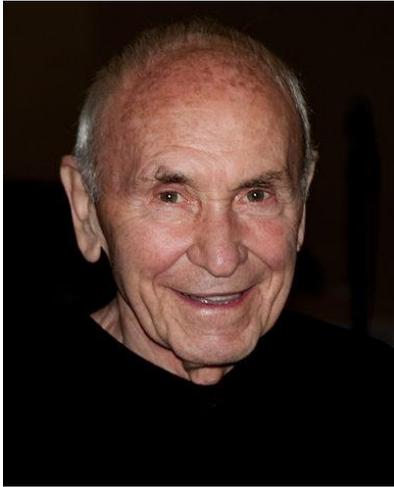
*The Reflective Practitioner* introduced concepts such as *reflection-on-action* and *reflection-in-action* which explain how professionals meet and learn from the challenges of their work.



## ***Double Loop Learning***

Argyris C & Schön D

# TRANSFORMATIVE LEARNING FOR CHANGE

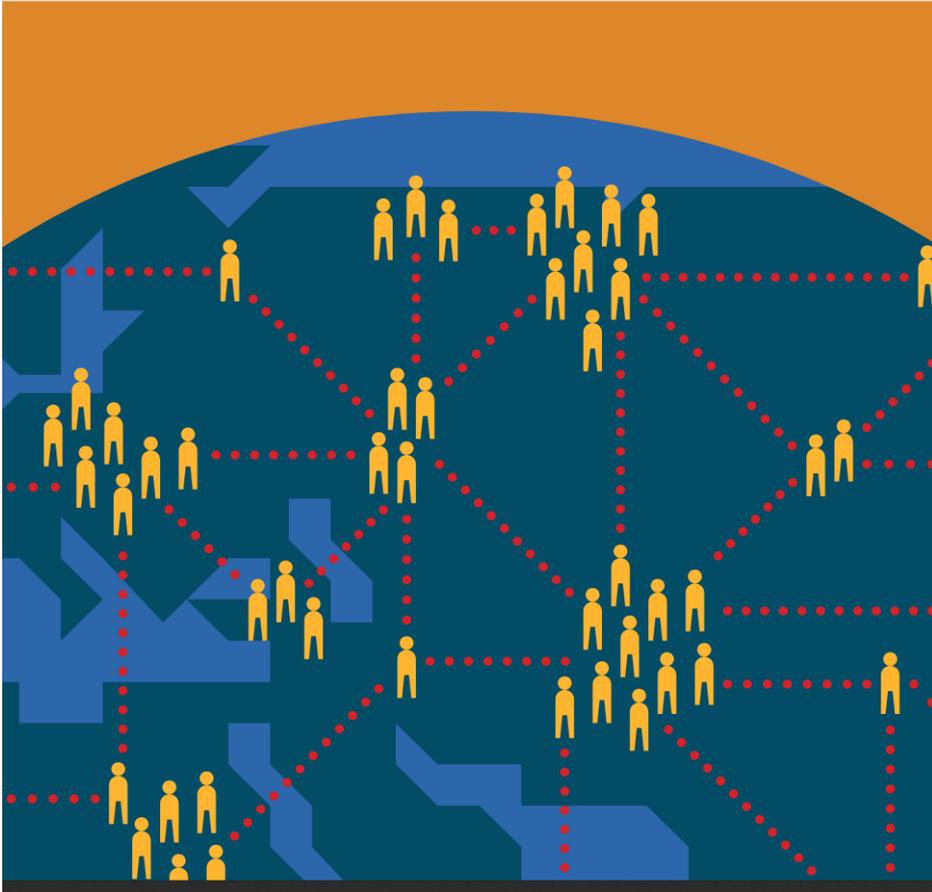


**Jack Mezirow**  
(1923-2014)

Transformative learning refers to the process by which we (adults) transform our taken-for-granted frames of reference to make us more inclusive, discriminating, open, emotional, capable of change, and reflective so that *we generate a new or revised interpretation of the meaning of one's experience in order to guide future action.*

*Transformative learning promotes deep learning for change.*

## The Learning Society



**How can we  
enable people to learn  
most effectively  
throughout their lives?**

Education systems will have a role to play, but only if they are radically reformed in ways that enable them to interact with and shape the *Learning Society* that surrounds them. A *Learning Society* that:

- 1 Engenders a culture of learning throughout life.
- 2 Aims to develop motivated, engaged learners who are prepared to conquer the challenges of tomorrow as well as those of today.
- 3 Takes learning to the learner, seeing learning as an activity, not a place.
- 4 Believes that learning is for all, that no one should be excluded.
- 5 Recognizes that people learn differently, and strives to meet those needs.
- 6 Cultivates and embraces new educational providers, from the public, private, and NGO sectors.
- 7 Develops new relationships and new networks between learners, providers (new and old), funders, and innovators.
- 8 Provides the infrastructure they need to succeed—still physical but increasingly virtual.
- 9 Supports systems of continuous innovation and feedback to develop knowledge of what works in which circumstances.



# WIKIPEDIA

The logo of Wikipedia, a globe featuring glyphs from various writing systems

Screenshot [\[show\]](#)

<b>Type of site</b>	Online encyclopedia
<b>Available in</b>	285 languages
<b>Country of origin</b>	United States
<b>Owner</b>	Wikimedia Foundation
<b>Created by</b>	Jimmy Wales Larry Sanger <sup>[1]</sup>
<b>URL</b>	wikipedia.org <a href="#">↗</a>
<b>Alexa rank</b>	▲ 14 <a href="#">↗</a> (Global, August 2020) <sup>[2]</sup>
<b>Commercial</b>	No
<b>Registration</b>	Optional <sup>[note 1]</sup>
<b>Users</b>	>294,798 active users <sup>[note 2]</sup> and >90,994,405 registered users 1,145 administrators (English)
<b>Launched</b>	January 15, 2001; 19 years ago
<b>Current status</b>	Active
<b>Content license</b>	CC Attribution / Share-Alike 3.0 Most text is also dual-licensed under GFDL; media licensing varies
<b>Written in</b>	LAMP platform <sup>[3]</sup>
<b>OCLC number</b>	52075003 <a href="#">↗</a>



## WHAT IS THE CONTRIBUTION FROM HIGHER EDUCATION?

# ARE WE READY FOR CHALLENGE BASED LEARNING?



# STRATEGY FOR A CHALLENGE BASED LEARNING PARADIGM AT MALMÖ UNIVERSITY



University wide  
research circle  
on CBL

2014



Faculty  
Learning Circles  
on CBL



CBL course  
development



Open CBL course  
offered by  
T & L

2016

# CHALLENGE BASED LEARNING (CBL)

Embracing both methods and approaches  
at Malmö University



- Problem Based Learning (PBL)
- Case Method
- Inquiry based learning (IBL)
- Interprofessional learning (IPL)
- Project Based Learning
- Transformative Learning
- Action Based Learning (ABL)
- Entrepreneurial learning
- Design for Learning (DFL)

# APPROACHES TO CHALLENGE BASED LEARNING

- **Student centered** - to both the individual and to learning
- Real-world challenges/problems are identified by students together with community partners
- Student as Partner
  
- **Learning** is viewed as a social, interactive and constructive process
- Curiosity is used to activate and motivate learning
- Learning as a research process - both critical thinking and critical doing
- Learning where evidence based education and innovation are linked
- Integration of knowledge, experiences, abilities, emotions, and application
- Includes reflection, feed-back, feed-forward, sharing of knowledge
  
- Challenges both learning processes and the **role of the teachers**
- Role of teacher varies in relation to the learning process
  
- Academic attributes and 21st Century skills become explicit

Students as

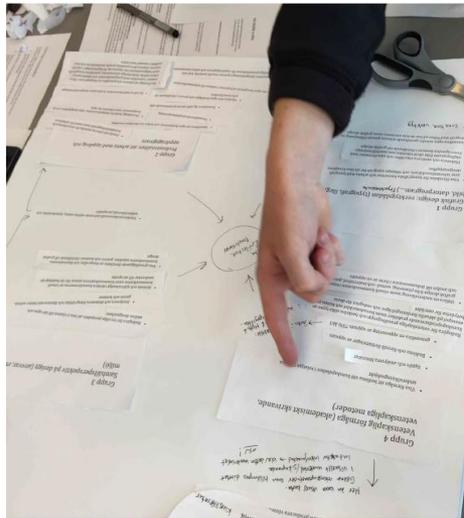


**PARTNERS**

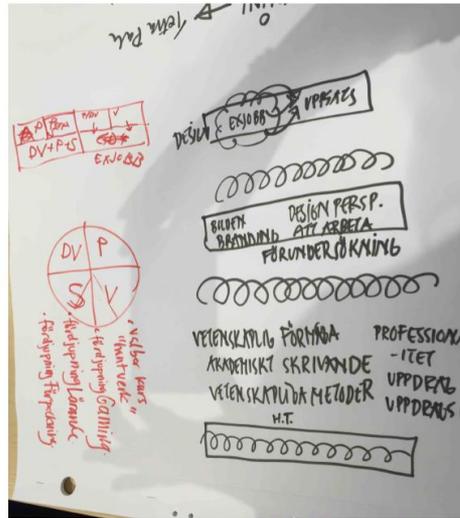
# RE-DESIGNING THE CURRICULUM BACHELOR PROGRAMME GRAPHIC DESIGN



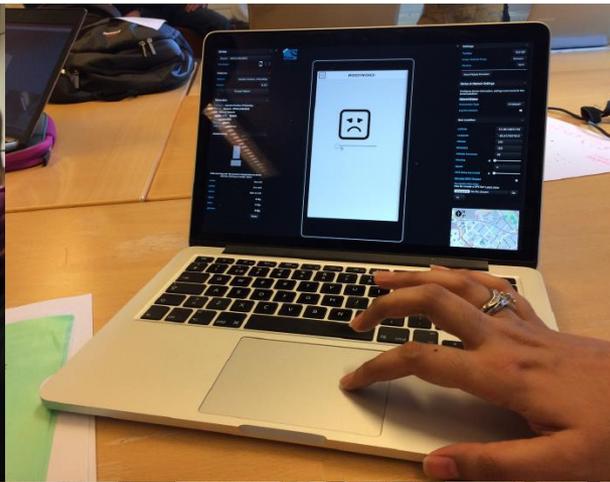
**Work as partners**



**Students**



**Teachers**



## General Teaching 2014:

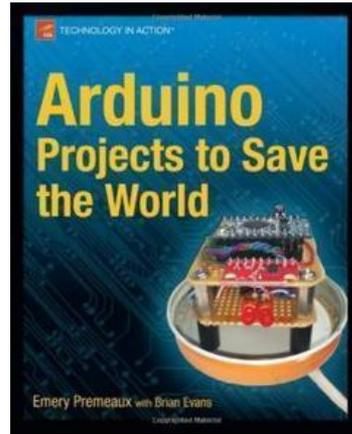
Dance and Media Art Network (DAMA) brought together Nordic university students and researchers in at each other's universities. CS students participated continuing with the notion that artistically and design-based projects provide real-world challenges for software engineers (first photograph). In the rest of the top row, project course for CS master students, where they design and build a mobile application that changes music based on the emotional terrain of the city.

First image bottom row, bachelor students in Media Technology doing a LEGO scrum workshop with LEGO bricks. Teaching design thinking with physical objects. Part project course with CS master students with Living Archives in the Slottsträdgården community garden. The students worked with members of the garden association to develop tools a result is a simple moisture measuring tool together with a mobile application to support the new gardener.

# CITIZEN LEARNING AND CO-CREATION IN HEALTH PROMOTION

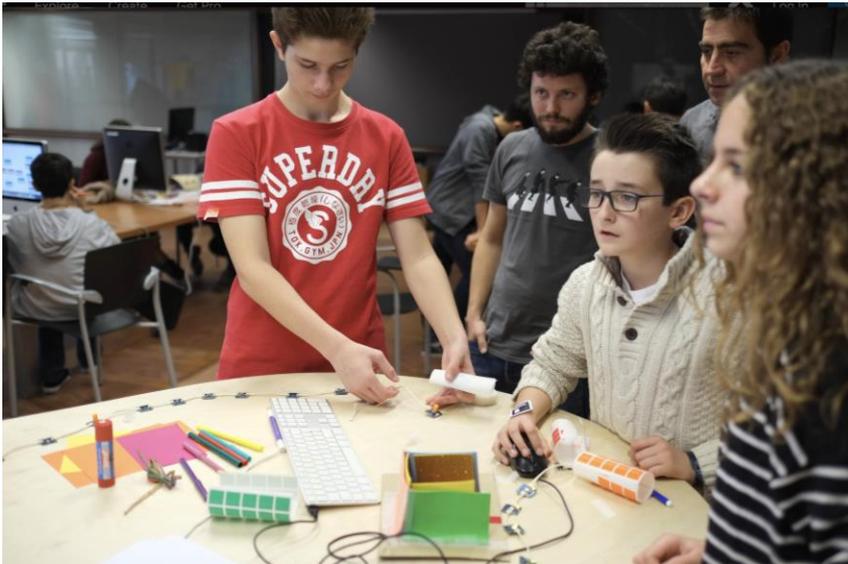


*Rathi Ramji PhD student at the Faculty of Health and Society, Malmö University*



<http://www.arduino.cc/>

**A tool to bring us closer in a more connected world.**



# STRATEGY FOR A CHALLENGE BASED LEARNING PARADIGM AT MALMÖ UNIVERSITY



A cross disciplinary team based on CBL research/education interest is organized

2015



Seminars on CBL concept and T&L methods



RECTOR'S GRANT  
4 research groups  
1 year to apply for external funding for CBL

2017-2018



Systematic Review CBL

CBL Position Paper

2020

# Challenge Based Learning in Higher Education

## – A Systematic Literature Review

Marie Leijon, Petri Gudmundsson, Patricia Staaf and Cecilia Christersson  
2020

### Abstract

The aim of this systematic review of literature was to map patterns in research publications on Challenge Based Learning (CBL) in higher education (HE) between 2009-2020 with a focus on the following research questions:

What research has been published?

How is CBL defined in HE settings?

Is CBL grounded scientifically in this research, if yes, how?

Thirty-six relevant articles during a period of 11 years were identified and analysed. The results show that CBL seems to be an accepted concept in HE, although with a variation in use and interpretation. Within the HE setting the definition of CBL is partly coherent with the Apple definition from 2008, but CBL has also moved from being a concept coined by a multinational technology company targeting learning in schools, to being embraced by HE both as a method for and an approach towards transformation of adult learning in higher education. ...

When	2009 (1)	2012 (2)	2013 (4)	2015 (4)	2016 (3)	2017 (2)	2018 (11)	2019 (8)	2020 (1)
Where	USA	USA 2	United Arab Emirates Spain/ Mexico Spain 2	Austria/Poland/ France Sweden Spain Thailand	Hong-Kong Sweden Spain	Spain China	Mexico Brazil 2 Indonesia Sweden Poland/Lithuania/ Switzerland Norway & six other countries. Australia USA 2 Chile	USA/England Italy Mexico 3 Spain Sweden/Tanzania Sweden	Hong-Kong
Discipline	Engineering	Design Engineering	English Engineering 2	Engineering 2 International business school Information management	Engineering Engineering/ computer - science Nursing	Engineering 2	Engineering 6 Engineering/ computer -science Social work education Environmental health Communication Business education	Engineering 6 Entrepreneurship education Medicine	Nursing

Table 1. The table illustrates when the articles, papers and abstracts were published, by whom, the geographical origins and the represented disciplines.

It is evident that the CBL concept proposed by Apple in 2008 to innovate the US school system, increasingly also been adopted and encouraged by various disciplines worldwide in HE during the last decade.

We can conclude that there are few research publications available on CBL within HE. We have identified only 36 relevant articles in English during a period of 11 years.

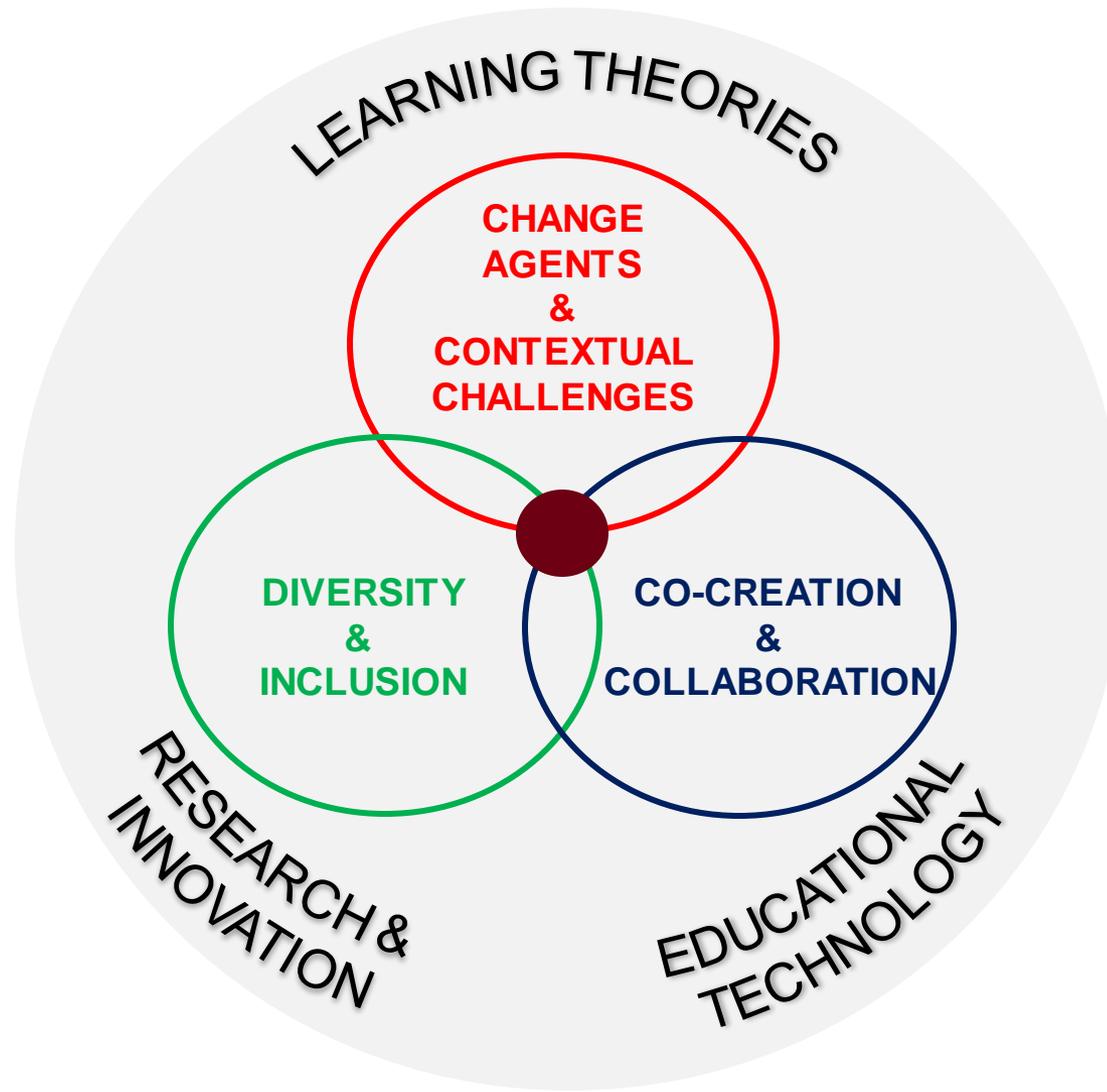
# DOMAINS OF CHALLENGE BASED LEARNING AT MALMÖ UNIVERSITY

- Takes a stand from theories of learning, the role of higher education in society, integration of research, education and innovation in HE
- Acknowledges the individuals' experiences, background and identity
- Includes collaborative and pedagogical methodologies for student centered learning
- Real-world challenges/problems are used to initiate a translational learning process
- Includes cooperation with a variety of societal partners nationally and internationally
- Promotes impact of change towards a learning society

**All six domains need to be compatible!**



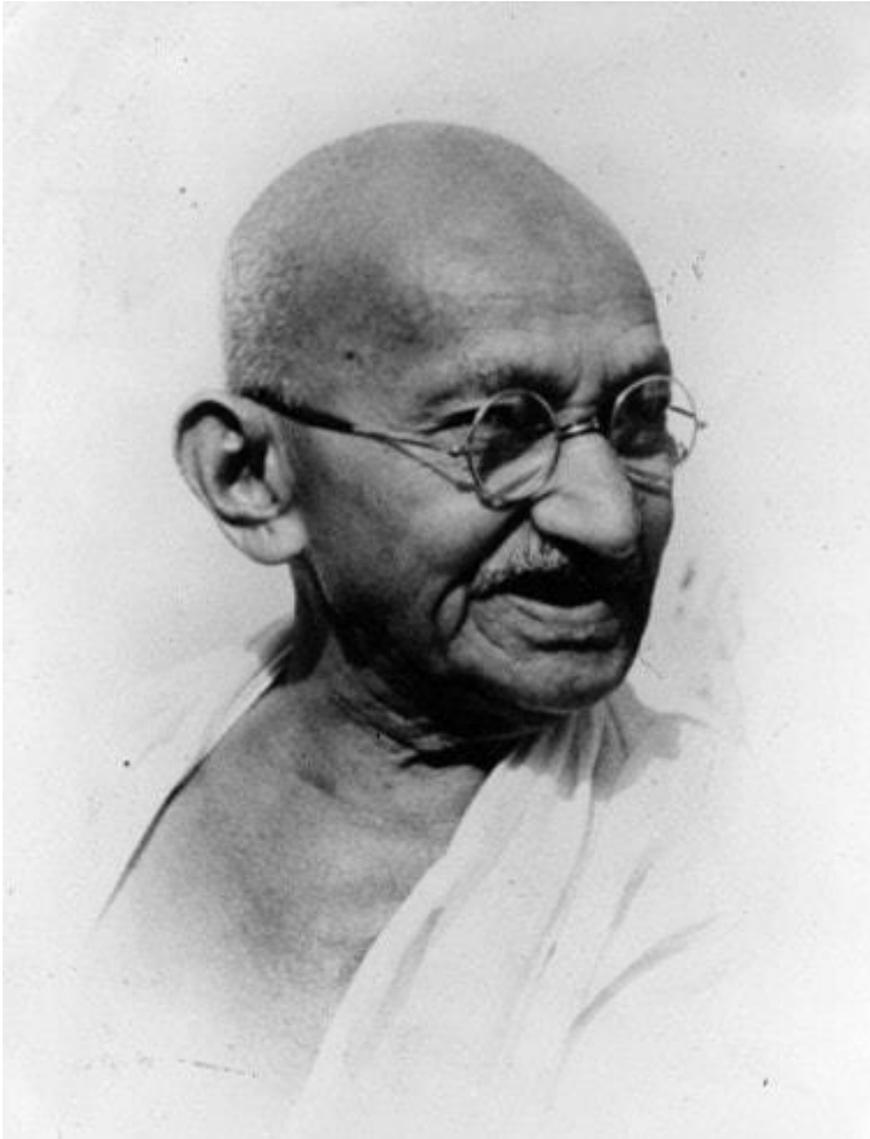
# CHALLENGE BASED LEARNING IN HE



**LEARNING FOR CHANGE  
IMPROVEMENT IN SOCIETY**

Teaching is more than  
imparting knowledge; it is  
inspiring change.

William Arthur Ward



**“You must be  
the change  
you wish to  
see in the  
world.”**

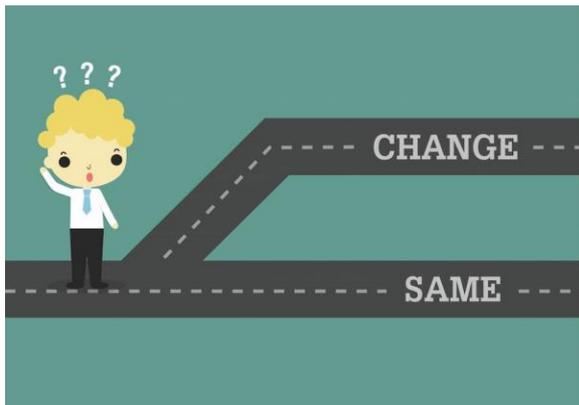
# CHANGES FOR IMPROVEMENT



LEARNING FOR CHANGE

# TRANSFORMATIVE LEARNING FOR CHANGE

An important part of transformative learning is for individuals to change their frames of reference by critically reflecting on their assumptions and beliefs and consciously making and implementing plans that bring about new ways of defining their worlds. This process is rational, analytical and evidence based.



# THE SOCIETALLY ENGAGED UNIVERSITY THE CIVIC UNIVERSITY

**INSTITUTIONAL  
LEADERSHIP**

**Collaboration on  
learning and research  
for social innovation**

**STAFF - STUDENT  
PARTNER  
ENGAGEMENT**

**Challenge Based  
Learning and Research  
as dispersed activities**

**Challenge Based  
Learning and Research  
as an integrated strategy**

**Traditional modes of  
collaboration on  
learning and research**

**FACULTY AND  
STUDENT  
ENGAGEMENT**

# IN SHORT: CBL and LEARNING FOR CHANGE

- A combination of relevant learning theories and real-life challenges make out the base for education, research and innovation
- Students and teachers/researchers are co-creators of knowledge and continuously investigate learning practise to improve education
- Education and research are inclusive, integrated and applied according to available evidence
- Students act within their community as change agents to improve society, individually and in group
- Higher education institutions take active role and responsibility in building a learning society

# Chamber of Commerce requests visualization of SDGs



<https://www.youtube.com/watch?v=MRZ8S3a6RTw&feature=youtu.be>

**THANK YOU FOR LISTENING ....**

**ANY QUESTIONS OR COMMENTS?**

**[cecilia.christersson@mau.se](mailto:cecilia.christersson@mau.se)**

## REFERENCES

Challenge Based Learning; A Class Room Guide

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CISCO Learning Society; White Paper 2010

[https://www.cisco.com/c/dam/en\\_us/about/citizenship/socio-economic/docs/LearningSociety\\_WhitePaper.pdf](https://www.cisco.com/c/dam/en_us/about/citizenship/socio-economic/docs/LearningSociety_WhitePaper.pdf)

Commission report for a sustainable Malmö

[https://malmo.se/download/18.1d68919c1431f1e2a96c8e4/1491298331527/malmo%CC%88kommisionen\\_rapport\\_engelsk\\_web.pdf](https://malmo.se/download/18.1d68919c1431f1e2a96c8e4/1491298331527/malmo%CC%88kommisionen_rapport_engelsk_web.pdf)

International Institute for Student as Partners

<https://macblog.mcmaster.ca/summer-institute/>