



人工智能时代的高等教育变革 ——IIOE全球伙伴峰会

An experience of developing open educational resource for fundamental engineering courses using teacher-friendly technology: Case study at MUST

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Recommendation on Open Educational Resources (OER)

Preamble

The General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO), meeting in Paris from 12 to 27 November 2019, at its 40th session,

Recalling that the Preamble of UNESCO's Constitution affirms, "that the wide diffusion of culture, and the education of humanity for justice and liberty and peace are indispensable to the dignity of man and constitute a sacred duty which all the nations must fulfil in a spirit of mutual assistance and concern",

Recognizing the important role of UNESCO in the field of information and communications technology (ICT) and in the implementation of the relevant decisions in this area adopted by the General Conference of that Organization,

Also recalling Article I of UNESCO's Constitution, which assigns to UNESCO among other purposes that of recommending "such international agreements as may be necessary to promote the free flow of ideas by word and image",

Affirming the principles embodied in the Universal Declaration of Human Rights, which states that all people have rights, duties and fundamental freedoms that include the right to seek, receive and impart information and ideas through any media and regardless of frontiers (Article 19), as well as the right to education (Article 26), and the right freely to participate in the cultural life of the community, to enjoy the arts, and to share in scientific advancement and its benefits, and the right to the protection of the moral and material interests resulting from any scientific, literary, or artistic production of which one is the author (Article 27),

Also affirming the 2007 United Nations Declaration on the Rights of Indigenous Peoples, which recognizes the rights of indigenous peoples in formulating national legislation and implementing national policy,

Noting the 2006 Convention on the Rights of Persons with Disabilities (Article 24), which recognizes the rights of persons with disabilities to education, and the principles contained in the 1960 Convention against Discrimination in Education,

Referring to the recommendation adopted at the 32nd session of the General Conference of UNESCO in 2003 with regard to the promotion of multilingualism and universal access to information in cyberspace,

Also referring to the 1997 UNESCO Recommendation concerning the Status of Higher-Education Teaching Personnel as well as the 1966 ILO/UNESCO Recommendation concerning the Status of Teachers, which stresses that as part of academic and professional freedom teachers "should be given the essential role in the choice and the adaptation of teaching material, the selection of textbooks and the application of teaching methods",

- Open Educational Resources (OER) are learning, teaching and research materials in any format with open license.
- OERs are one key prerequisite to achieve educational digital transformation and SDG 4
- Especially **digital video contents**, are the main essence in online and blended learning for Z and alpha generation (Learning style is observer).

Seemiller, C. and Grace, M., 2017. Generation Z: Educating and engaging the next generation of students. About campus, 22(3), pp.21-26.

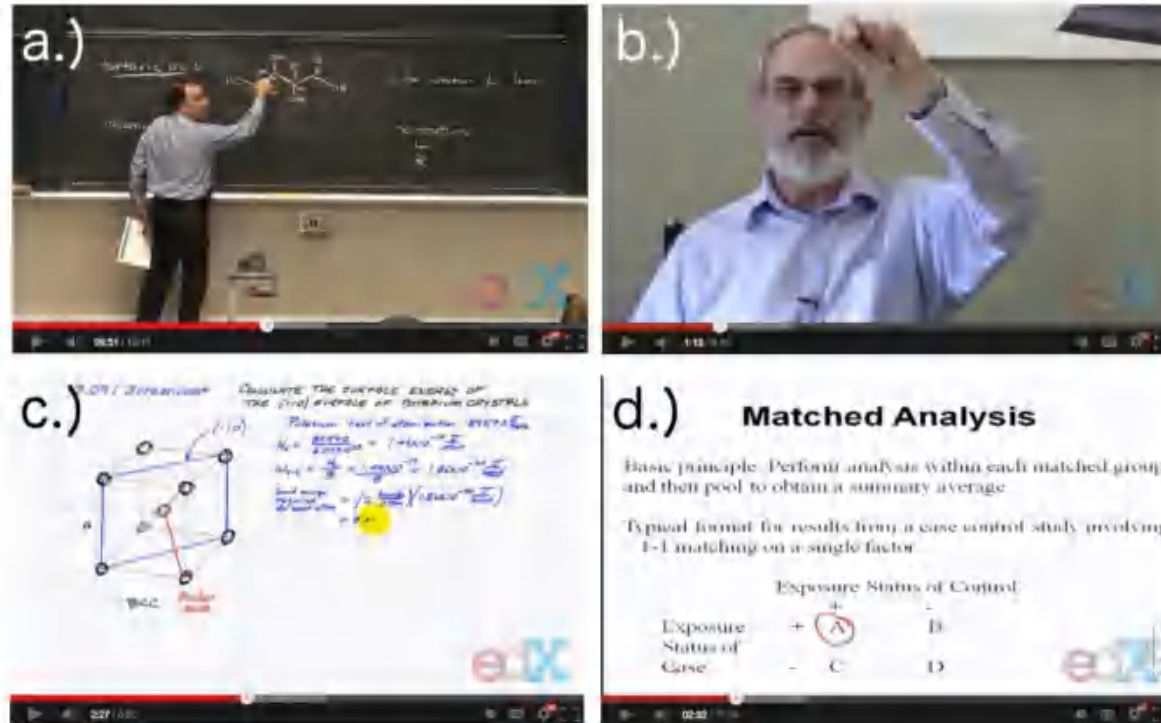


Figure 1. Video production style often affects student engagement in MOOCs. Typical styles include: a.) classroom lecture, b.) “talking head” shot of an instructor at a desk, c.) digital tablet drawing format popularized by Khan Academy, and d.) PowerPoint slide presentations.

Adapted from: Guo, P.J., Kim, J. and Rubin, R., 2014.

These are what teachers prefer.

Types of video contents (6.9 million watching sessions)

- Classroom lecture recording
- Talking head
- Digital tablet drawing (Khan Academy)
- PowerPoint slide presentation

Student preference and engagement:

- ✓ Shorter videos > longer
 - ✓ Instructor face > no talking head
 - ✓ Personal feeling > Studio shooting
 - ✓ Tablet drawing (Khan academy style) > presentation recordings
 - ✓ Pre-recorded classroom lecture is not engaging
 - ✓ Instructor speak fast
- These are what student prefer.

L@S 2014 • Course Materials

March 4–5, 2014, Atlanta, Georgia, USA

How Video Production Affects Student Engagement: An Empirical Study of MOOC Videos

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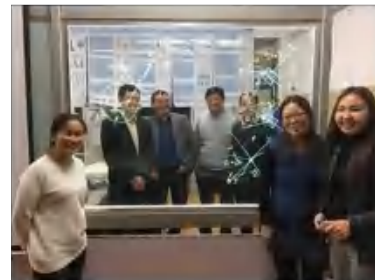
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Light-board technology development at MUST



Glass whiteboard
(2010)



(2018)



(2019)



(2020)



(2021)



The first
Lightboard at
MUST (2017)

Cheap, Fast, Teacher-friendly (similar to traditional blackboard)

Picasso drawing on glass

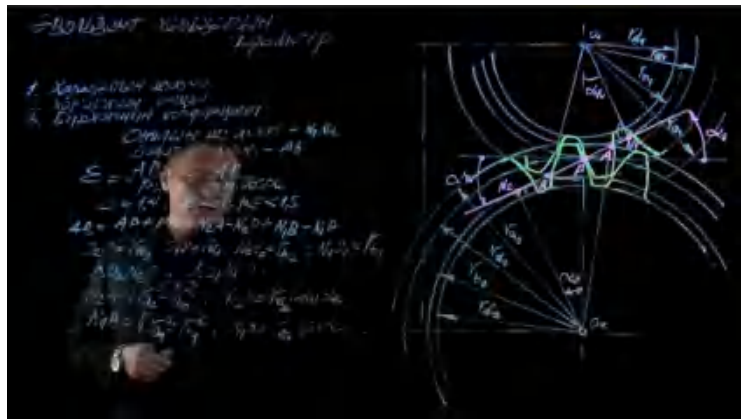
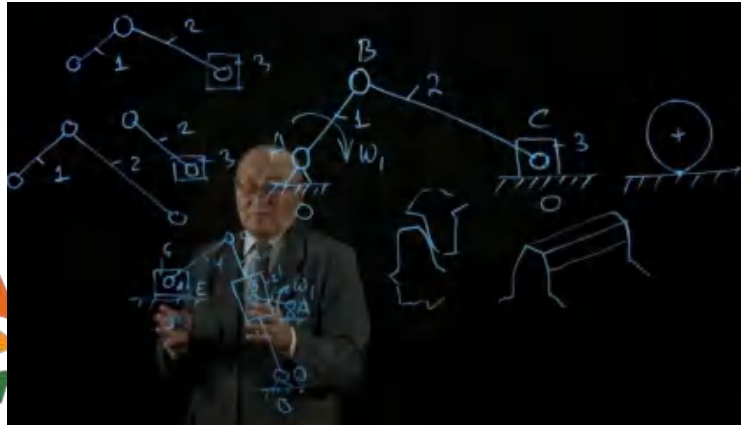


<https://www.youtube.com/watch?v=UOMI1JKfWwc>

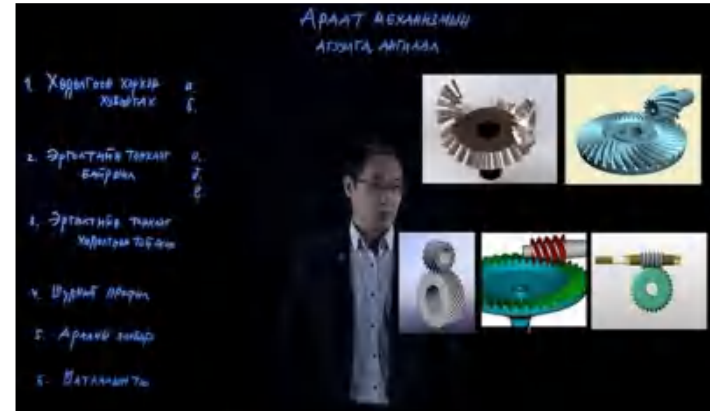


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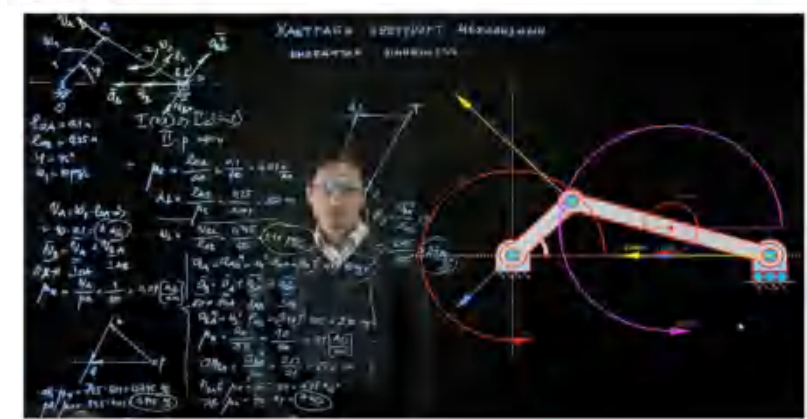
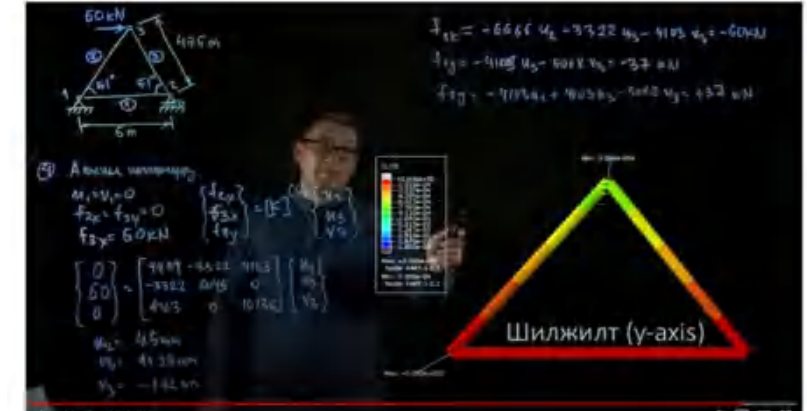
1st Generations of Digital Professors



2nd Generations of Digital Professors



3rd Generations of Digital Professors





Engineering
Mechanics



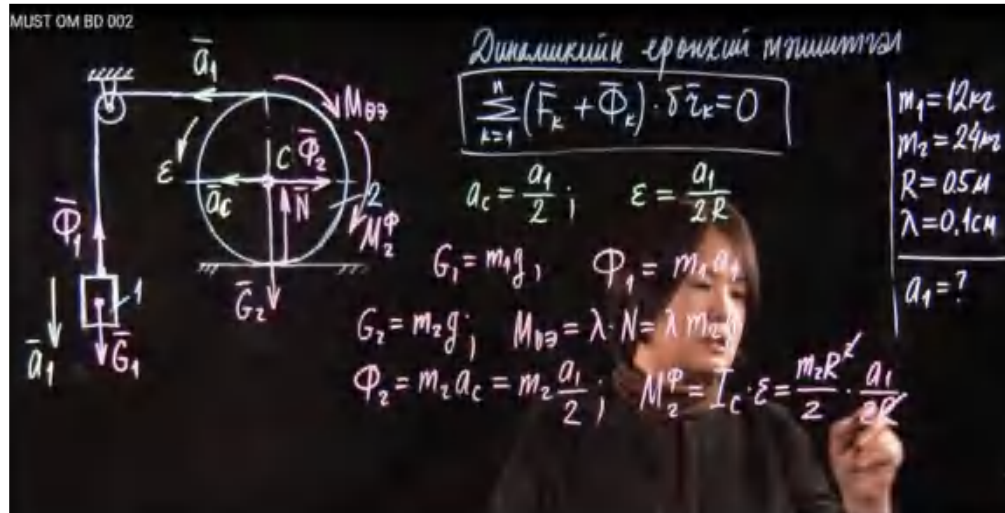
Mechanics of
Materials



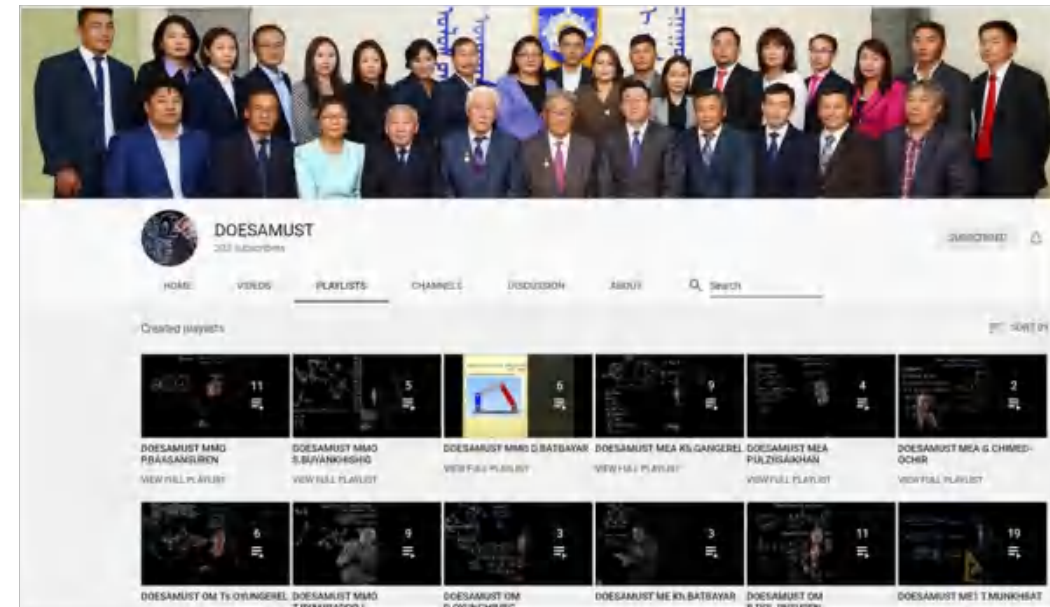
Design of Mechanisms
and Machines







Machine Parts and
Components



<https://www.youtube.com/channel/UCLiXPjzPGrzcbccjvyqssVw/playlists>



174 open video contents (2020- March)

Traffic source 	 Views 	Watch time (hours)	Average view duration
<input type="checkbox"/> Total	83,916	4,031.9	2:52
<input type="checkbox"/> External	19,054 22.7%	1,146.6 28.4%	3:36
<input type="checkbox"/> Playlists 	15,954 19.0%	594.4 14.7%	2:14
<input type="checkbox"/> YouTube search	15,656 18.7%	828.7 20.6%	3:10
<input type="checkbox"/> Channel pages	9,931 11.8%	289.0 7.2%	1:44
<input type="checkbox"/> Suggested videos	8,645 10.3%	407.1 10.1%	2:49
<input type="checkbox"/> Direct or unknown	7,745 9.2%	483.7 12.0%	3:44
<input type="checkbox"/> Browse features	4,010 4.8%	135.1 3.4%	2:01
<input type="checkbox"/> Other YouTube features	2,747 3.3%	143.7 3.6%	3:08
<input type="checkbox"/> Notifications	171 0.2%	3.6 0.1%	1:15
<input type="checkbox"/> Hashtag pages	3 0.0%	0.1 0.0%	1:39



84 K- views, 4K hour of watch time

22.7% of views from external sources

Geography	Views ↓	Watch time (hours)	Average view duration
<input type="checkbox"/> Total	83,916	4,031.9	2:52
<input type="checkbox"/> Mongolia	70,631 84.2%	3,453.5 85.7%	2:56
<input type="checkbox"/> Japan	84 0.1%	2.3 0.1%	1:39
<input type="checkbox"/> United States	67 0.1%	1.4 0.0%	1:13
<input type="checkbox"/> Russia	15 0.0%	0.1 0.0%	0:25
<input type="checkbox"/> Philippines	13 0.0%	0.2 0.0%	0:54
<input type="checkbox"/> Canada	10 0.0%	0.1 0.0%	0:39
<input type="checkbox"/> Singapore	10 0.0%	0.0 0.0%	0:08

~85% - Mongolia

Average view duration = 2.52 min

Device type 	Views 	Watch time (hours)	Average view duration
<input type="checkbox"/> Total	83,916	4,031.9	2:52
<input type="checkbox"/> Mobile phone	45,728 54.5%	2,024.0 50.2%	2:39
<input type="checkbox"/> Computer	36,742 43.8%	1,912.4 47.4%	3:07
<input type="checkbox"/> Tablet	676 0.8%	47.3 1.2%	4:11
<input type="checkbox"/> TV	273 0.3%	21.7 0.5%	4:46

Viewer gender  	Views 	Average view duration	Average percentage viewed	Watch time (hours)
<input type="checkbox"/> Male	68.3%	2:57	12.4%	69.3%
<input type="checkbox"/> Female	31.7%	2:49	12.3%	30.8%



What we learn:

- Lightboard technology can address student need and teachers preference for developing digital video contents.
- Developed video contents need to be integrated in the external sources such as text book, reading materials, lecture presentation etc. . . to increase access
- It is better to create short video less than 3 min
- Video contents should be smartphone user-friendly
- More strategies needed to increase student engagement and attention



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AI



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شكر

谢谢

Thanks

Merci

Спасибо

Gracias