Learn STEM

# The Online Course Innovative Pedagogy for STEM Education

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## Innovative STEM learning in schools

# The Online Course Innovative Pedagogy for STEM Education

http://www.learn-STEM.org

**Coordinator:**
Open University of the Netherlands (OUNL)

**Project Partners:**
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## The Online Course Innovative Pedagogy for STEM Education

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# Learn STEM Intellectual Output 3:

# The Online Course
# Innovative Pedagogy for STEM Education

Intellectual Output 3 (IO 03) consists of five activities: Design of the **Learn STEM** learning environment architecture (IO 03-A1), Development of the technical functionalities of the **Learn STEM** online learning environment (IO 03-A2), Integrate the training contents, delivery and assessment tools, and inquiry learning package in the **Learn STEM** online learning environment (IO 03-A3), Testing of technical functionalities (IO 03-A4) and Validation of the **Learn STEM** online learning environment (IO 03-A5).

The output of IO 02 was coordinated by the Open University of the Netherlands with the support of all partners providing their contributions based on their expertise and based on the agreed methodological approach (design template, design groups, national testing and consultation workshops, live events and final survey). The coordinator Open University of the Netherlands was realizing the complete development (IO 03-A2) and integration (IO 03-A3) of the Online Course including the creation of all learning materials and the six videos. The other partners contributed to the design of the Online Course in shared responsibilities and group work collaboration as presented in the following table:

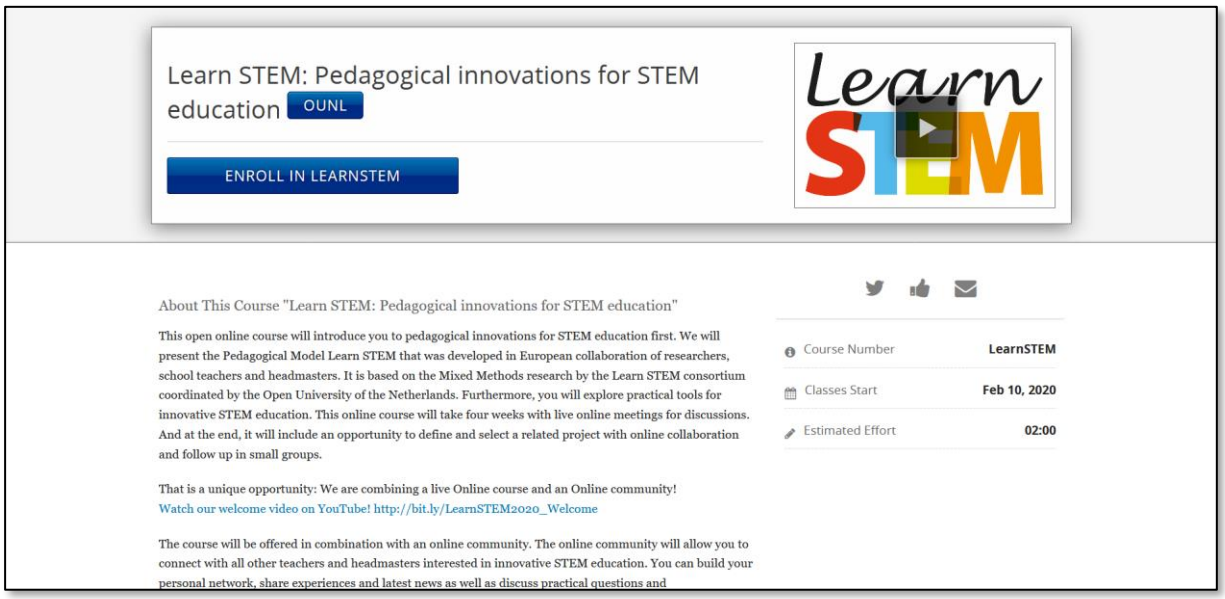
| | Lead partner | Contributors |
|---|---|---|
| Introductory weeks | OUNL | - |
| Week 1 | KSDP | KSTP, OUNL |
| Week 2 | OUNL | Agora, OUNL |
| Week 3 | GSEN | MP, TUASW, OUNL |
| Week 4 | Effebi | Eeekhout, OUNL |

The results from the Technical testing (IO 03-A4) and Validation of the **Learn STEM** Online Course (IO 03-A5) were enriched by the final online survey for all participants designed and realized by the OUNL and are presented in the separate Report on National Testing and Consultation Workshops prepared by KSTP. Thus, this report only focuses on the design, implementation and realization of the online course (IO 03-A1 to -A3).

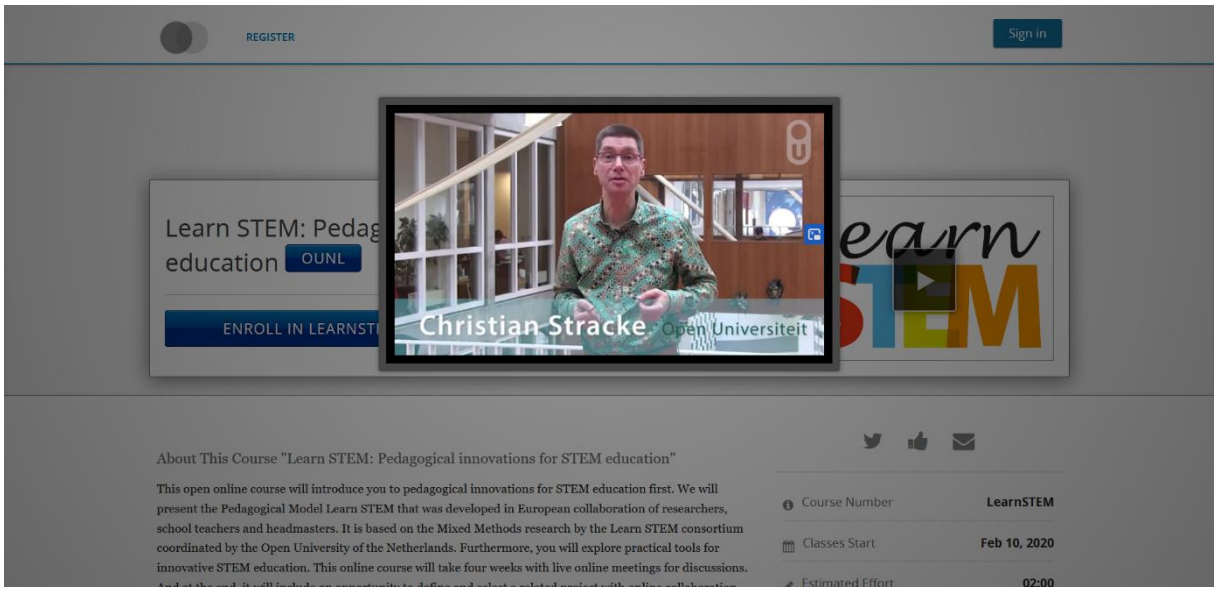
Originally it was planned that the **Learn STEM** Online Course would be officially launched at the European **Learn STEM** Conference scheduled for 26th of March 2020. Unfortunately, we had to cancel our final conference due to the COVID-19 outbreak. Therefore, all Learn STEM partners decided in consensus to postpone the final conference and finally to realize it as an Online Conference on 29th of April 2020 as it is shown on the modified posters:

The **Learn STEM** Online Course was luckily not further affected by the postponed online conference and it could be designed and implemented in time by the Open University of the Netherlands. As proposed, it was developed in the open source platform open edX provided by the OUNL using a contracted and paid third party hosting provider. Due to the selection of the open source platform open edX, the whole **Learn STEM** Online Course **can be easily exported as a single file** and **can be directly imported, adapted and re-used** in any other open edX platform and implementation. That ensures that the **Learn STEM** Online Course can be repeated as many times as preferred.

The starting page of the **Learn STEM** Online Course could be reached by the link: www.competencedevelopment.eu and looks like this screenshot:

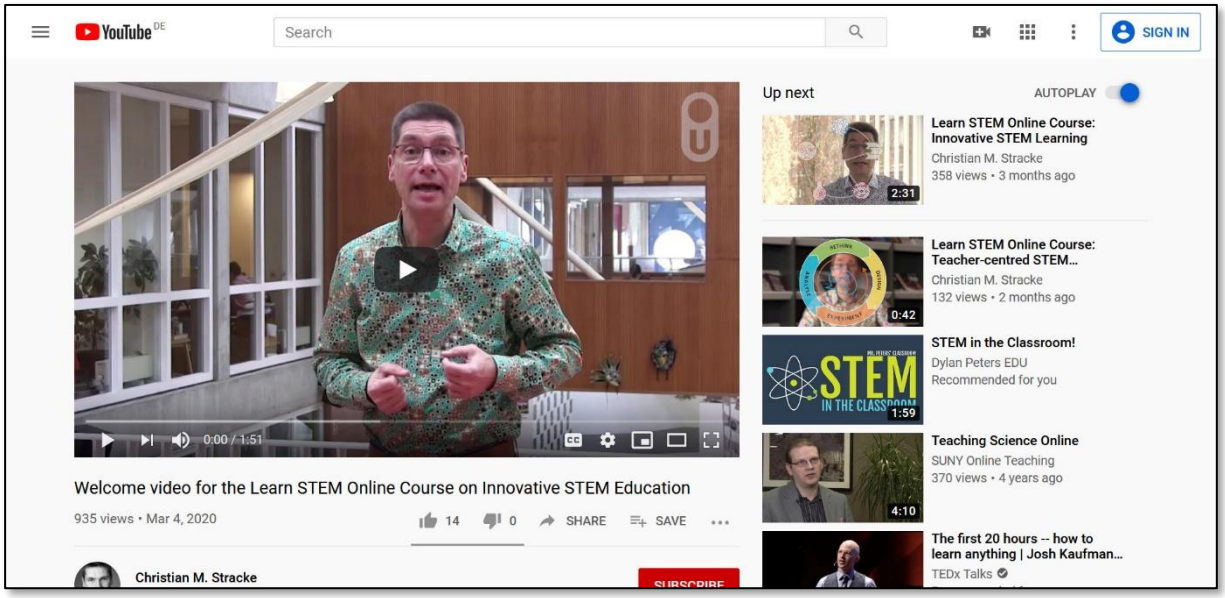


It includes an introductory welcome video produced by the OUNL that is opening and can be seen by clicking on the button above the **Learn STEM** logo on the top right:




The video was recorded by the professional video team from the OUNL in the Agora school in Roermond highlighted in the video by the **Learn STEM** coordinator Christian M. Stracke:

This introductory welcome video was also published on YouTube for our common promotion by all partners and in all social media and dissemination channels:
www.youtube.com/watch?v=KRd5cEfbSTU

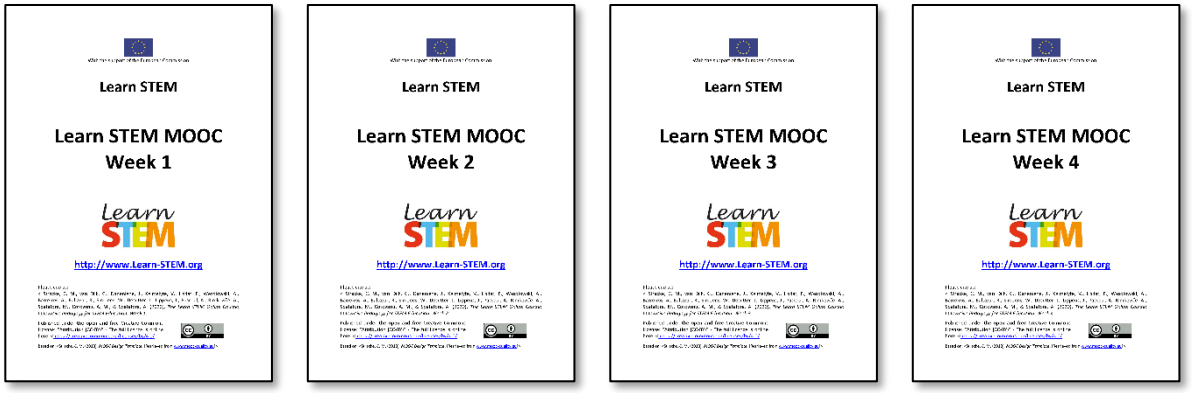



For the lauch and duration of the **Learn STEM** Online Course, we decided to keep the original timing as shown in the following table:

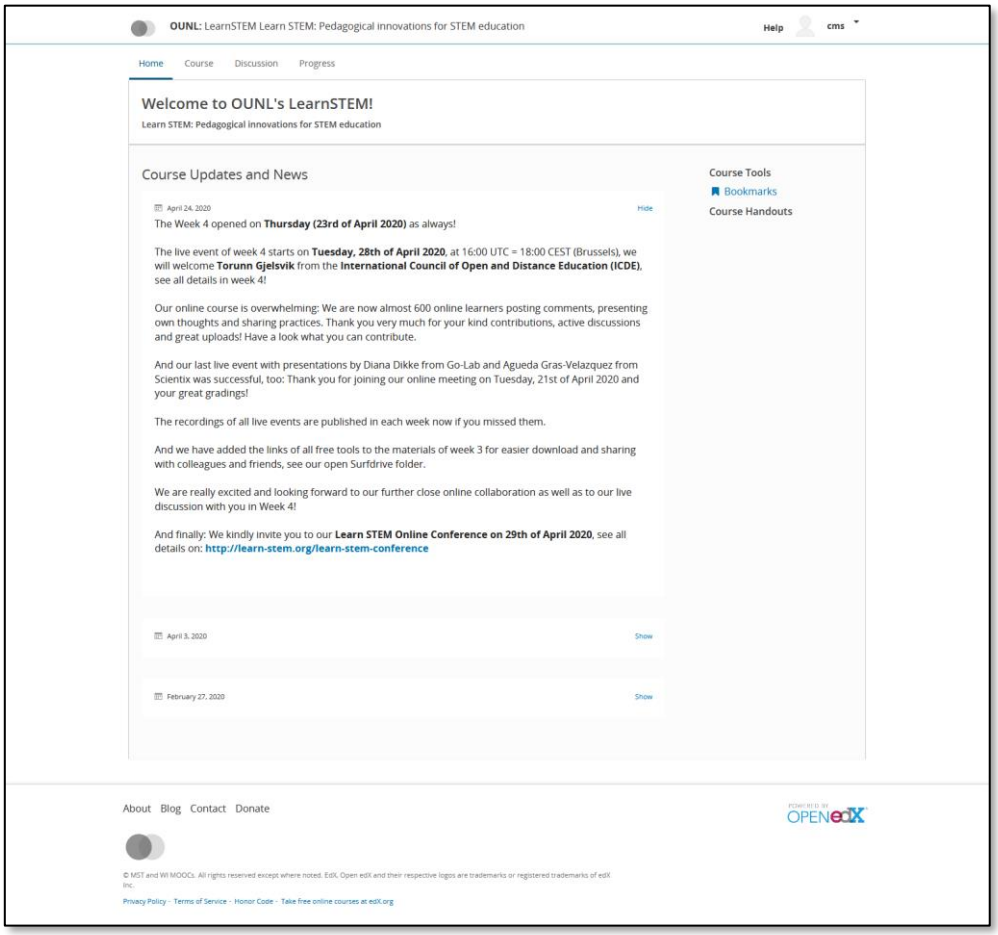
| Online Course | Lead partner | Live event |
|---|---|---|
| Registration opening | 10th of February 2020 | none |
| Introductory weeks | 12th March 2020 to 25th March 2020 | none |
| Week 1 | 26th March 2020 to 1st April 2020 | Tuesday, 31st of March 2020 at 16.00 UTC / 18.00 CEST |
| Week 2 | 2nd April 2020 to 15th April 2020 | Tuesday, 7th April 2020 at 16.00 UTC / 18.00 CEST |
| Week 3 | 16th April 2020 to 22nd April 2020 | Tuesday, 21st April 2020 at 16.00 UTC / 18.00 CEST |
| Week 4 | 23rd April 2020 to 29th April 2020 | Tuesday, 28th April 2020 at 16.00 UTC / 18.00 CEST |

The Week 2 was extended due to the vacation time (Easter holidays) as requested by many school teachers and headmasters that we have asked before the launch of the Online Course.

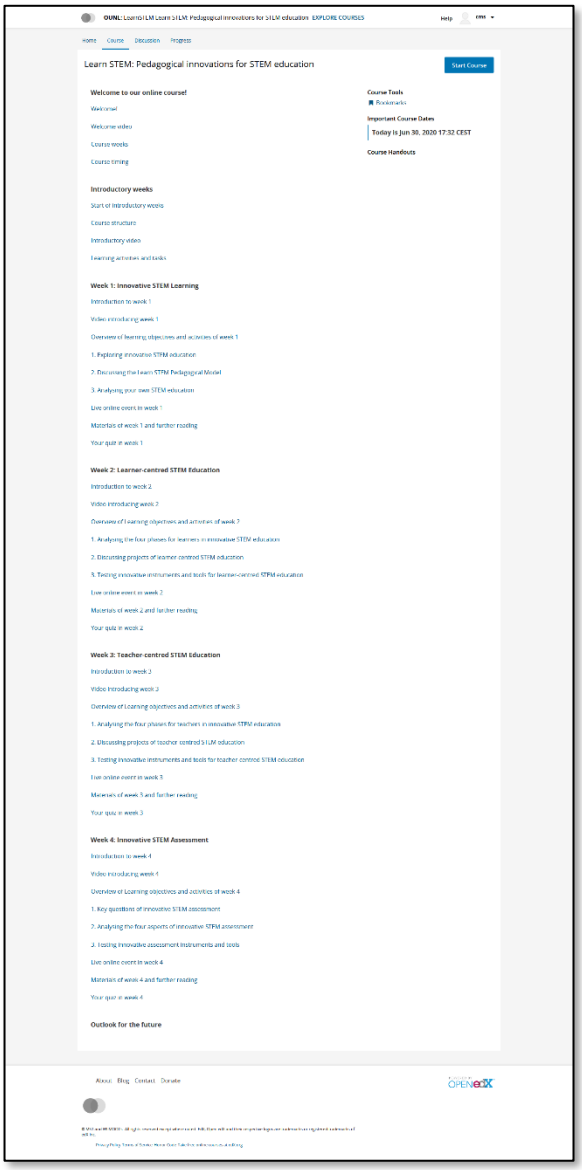
And the design and content of the **Learn STEM** Online Course **are openly and freely published** with an open and free Creative Commons license: That means that the design and the content are **available, adaptable and re-usable for any other purposes and STEM learning and education providers**.



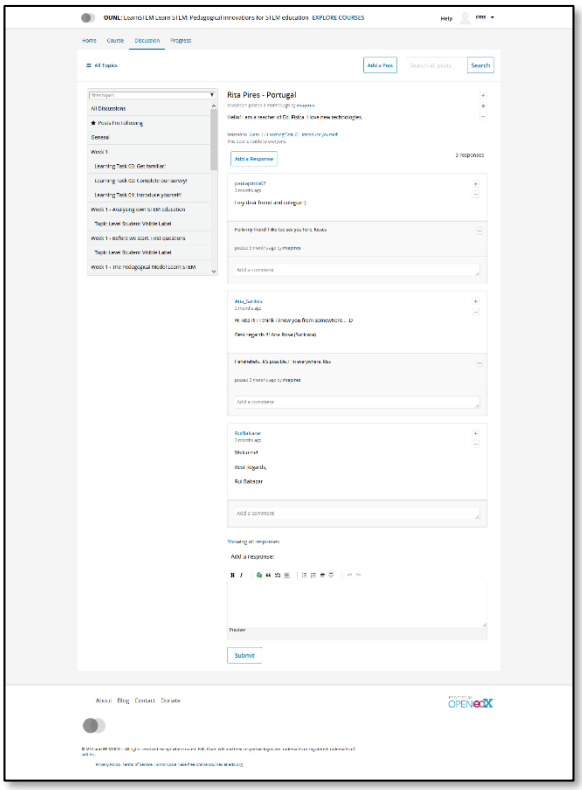

The following screenshots will provide an overview and a first impression about the design and implementation of the Learn STEM Online Course that was higly appreciated by the participants:



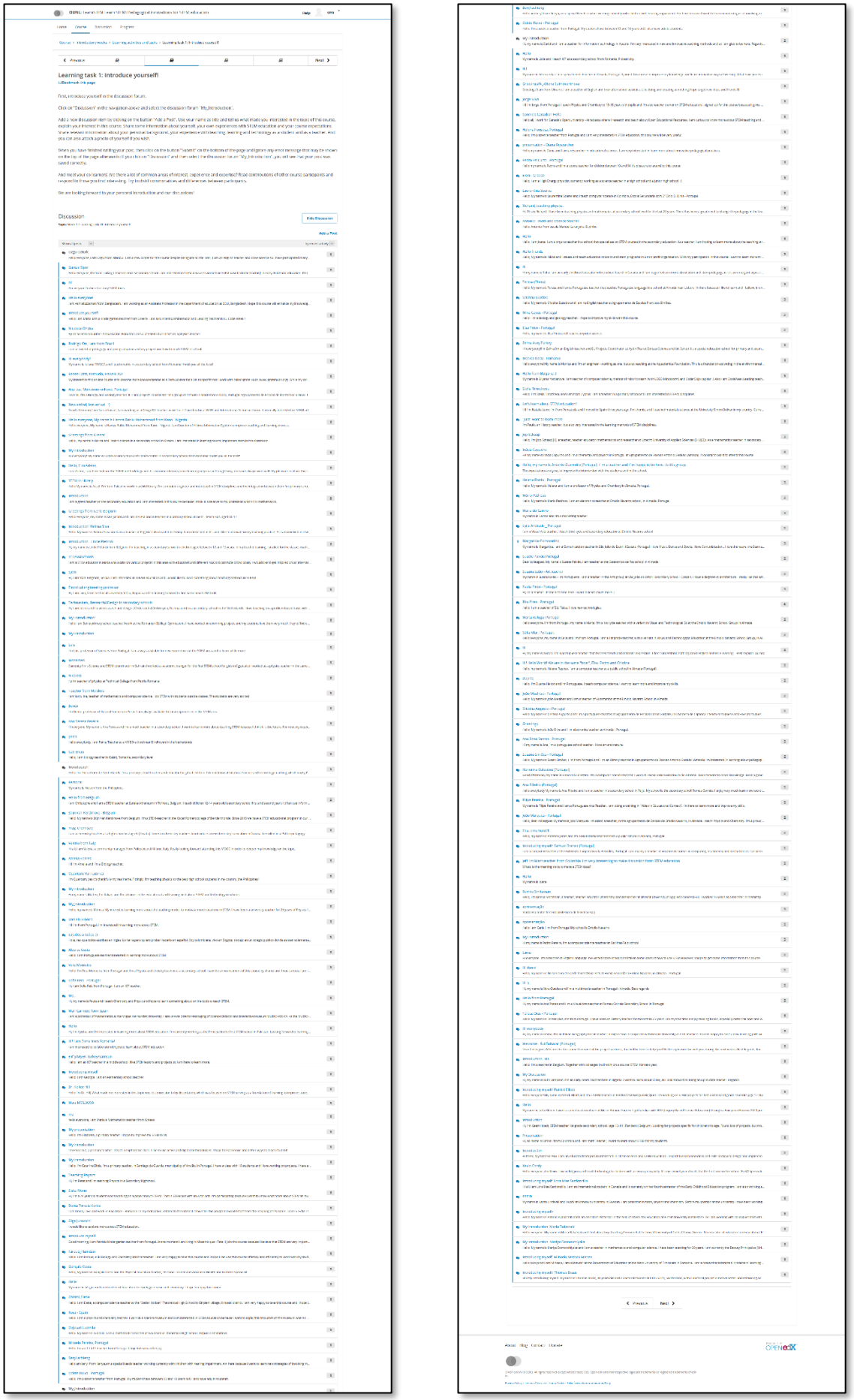

The Online Course Welcome Page (in Week 4)



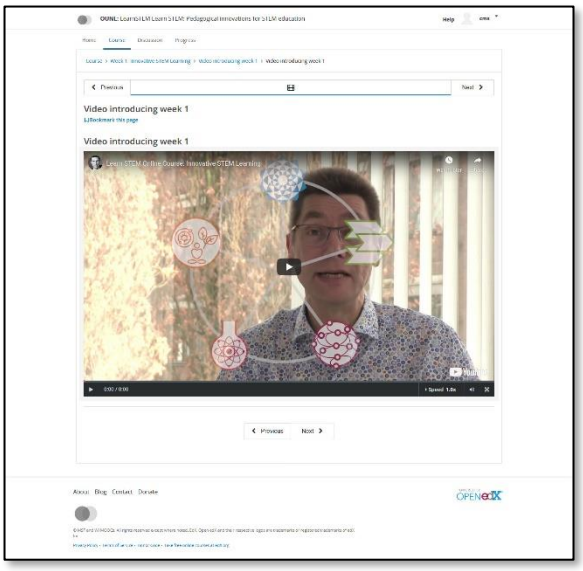

The Structure of the **Learn STEM** Online Course in Overview



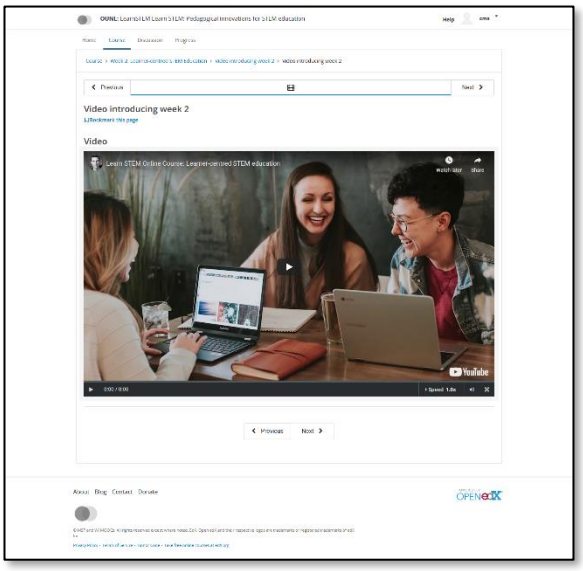

The Discussion Forum of the **Learn STEM** Online Course



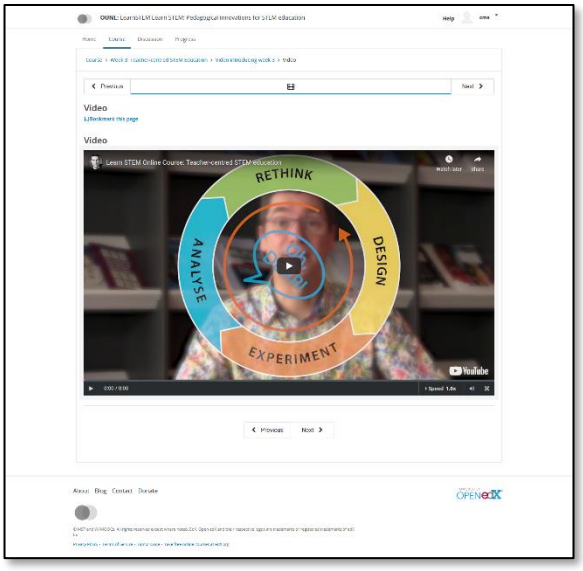
The Discussion Forum for Task 1: Introduce yourself!



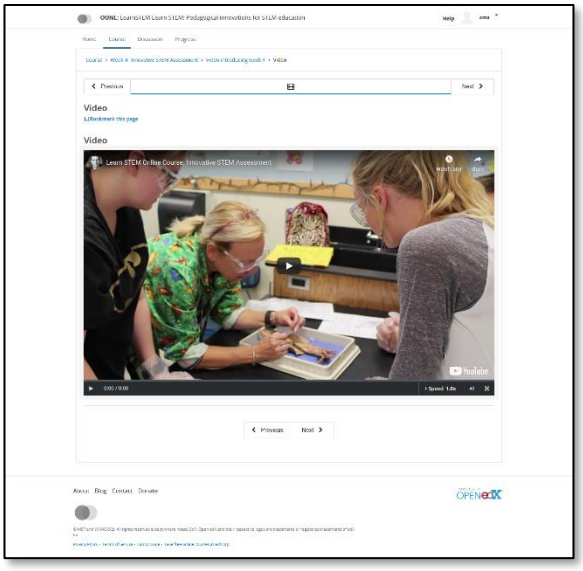

Introductory Video of Week 1




Introductory Video of Week 2




Introductory Video of Week 3




Introductory Video of Week 4

Furthermore, all live events of the four weeks with the **Learn STEM** partners and with the external experts were recorded and are available online, too. The links for the YouTube videos and the recorded live events can be found in the MOOC design description. The complete **Learn STEM** Online Course is available online at: www.competencedevelopment.eu

To summarize, we are very happy with the **Learn STEM** Online Course, its impact, huge amount of more than 600 participants and their excellent and unique grading for the whole **Learn STEM** Online Course: **4.9 out of 5**!

We are looking forward to repeat the **Learn STEM** Online Course again soon!

# About Learn STEM, the European Alliance for Innovative STEM learning in schools:

We need innovative and better school education in Science, Technology, Engineering and Mathematics (STEM) as key sectors for our future life, work and society. The European Alliance **Learn STEM** focuses their interrelation and integration in cross-disciplinary and reflective STEM education and pedagogical methodologies. Main goal of **Learn STEM** is to improve the quality and efficiency of STEM learning in secondary schools. Consequently, **Learn STEM** is increasing the pupils' interest in STEM and building STEM competences. Therefore, **Learn STEM** designs and provides pedagogical methods and tools for secondary schools to explore and solve real life questions. Thus, **Learn STEM** supports and contributes to the key objective of the European Education and Training 2020 Strategy (ET 2020) that fewer than 15% of 15-year-olds should be under-skilled in reading, mathematics and science.

Moreover, the **Learn STEM** project also addresses the need to enhance knowledge of and about science as a precondition to prepare Europe's population to be actively engaged, responsible citizens as well as conversant with the complex challenges facing society. In the PISA study 2015, most students expressed a broad interest in science topics and recognised the important role that science plays in their world; but only a minority reported their participation in science activities. In addition, teachers still declare they need more professional development linked to tailoring, diversifying, and innovating teaching practices. Thus, **Learn STEM** is strengthening secondary schools' capacity to develop skills in subjects such as science, technology, engineering and mathematics through innovative and interactive pedagogical methods and approaches. Therefore, **Learn STEM** designs and provides practical instruments and online tools for secondary schools and their teachers and pupils to explore and solve real life questions.

Under the leadership of the coordinator Dr. Christian M. Stracke from the Open University of the Netherlands, **Learn STEM** brings together nine Partners from six European countries. They are collaborating for innovative STEM education and have developed the **Learn STEM** Pedagogical Model, the Inquiry learning package, a teacher training programme and an online course. These instruments are tested, evaluated and continuously improved in close cooperation with hundreds of STEM experts and school teachers. All **Learn STEM** results and achievements are openly and freely available on the **Learn STEM** website online:

## http://www.Learn-STEM.org

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Erasmus+

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