ESCALATE

TRAINING MATERIAL

ENABLING OPEN-SOURCE TECHNOLOGY AND INNOVATIVE SOLUTIONS FOR EDUCATORS AND STUDENTS

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Enabling Open-Source Technology and Innovative Solutions for Educators and Students

The module will help to understand the availability and potential offered by open-source technologies in the specific relation between students and educators, identifying also the impact on the involved institutions.

Learning Objectives

- To better understand how digitalisation is affecting the inter-relation between students and teachers
- To recognise how universities are changing while adopting these new teaching methods
- To understand how different tools and solutions for educators and students can be used in different circumstances and which fit best to your need
- To understand an ideal way to integrate this innovative solutions in the traditional process of teaching
- To explore examples of the extreme use of open-source technology and innovative solutions for educators and students due to COVID-19 situation

Module 2: overview of the main topics

Unit 1. Open Source Technologies in Education

Unit 2. Impacts and Benefits of Open Source Technologies in Education

Unit 3. Examples of Solutions

The objectives of this Module are:

- To better understand how open source technologies support the inter-relation between students and teachers
- To understand how to integrate this innovative solutions in the traditional process of teaching
- To show use cases of innovative solutions for educators and students developed during the COVID-19 emergency

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Contents of each unit

Unit 1:

1.1	Definition of Open Source and Distinction from Open Educational Resources
1.2.	Open Source Technologies in Education
1.3.	Open Source Technologies Teaching Process

Unit 2:

2.1	Overview of Technologies and Solutions available for Universities and Schools
2.2.	Benefits of Open Source Software in Education
2.3.	Exploration of Potential Impacts (also to respond to the needs emerged during COVID-19 emergency)

Unit 3:

3.1.	Open Source solutions Examples in Education
3.2.	Additional Tools adopted and available for Universities
3.3.	Recommendations and Conclusions

1.1. Definitions of Open Source and Distinction from Open Educational Resources (1/2)

Open Source

The term **open source** refers to something people can modify and share because its design is publicly accessible

The open source way: projects, products, or initiatives that embrace and celebrate principles of open exchange

Open Educational Resources

Open educational resources (OER) are freely accessible, openly licensed text, media, and other digital assets that are useful for teaching, learning, and assessing as well as for research purposes

MOOCs (Massive Open Online Courses) are an example of OER

Source: [Unit 1: ref 2]

1.1. Definition of Open Source and Distinction from Open Educational Resources (2/2)

Open Source Software (OSS)

- Source code that anyone can inspect, modify, and enhance
- Programmers can improve the code by adding features to it or fixing parts that don't always work correctly unlike closed or proprietary software

Source: [Unit 1: ref 3,4]

1.2. Open Source Technologies in Education

Internet is necessary for the implementation of e-learning and distance learning, and this requires appropriate Web server hardware and software where to use OSS:

- Server Software (e.g., Apache)
- Workstation Software (e.g., OpenOffice)
- Library Management Systems
- Learning Management Systems (e.g., Moodle)
- Other Educational Software

Source: [Unit 1: ref 6]

Did you know...

The Top Open Source Software in Education

The top five open source learning management systems in 2019 were **Moodle**, **Chamilo**, **Open edX**, **Totara Learn** and **Canvas**, as published by eLearning Industry site based on online reviews.

The top five open source softwares for school management in 2021 are **Edisapp**, **AscendSMS**, **EduSis School**, **RosarioSis** and **Open School**, ranked by Software Suggest site based on online reviews.

The top five open source library management softwares in 2019 were **Koha**, **Evergreen**, **BiblioteQ**, **Opals** and **OpenBiblio**, as published in a comparison by GoogFirms site.

Source: [Unit 1: ref 9,10,11]

1.3. Open Source Technologies teaching process

- Teaching/learning processes are **created and recreated** through participant activities
- Focus on **human contributions** and ultimate control of educational experience;
- Skills and motivations provide students **entry points** into productive online learning systems
- Knowledge is a **shared ongoing endeavor**
- Learners are engaged and work with other participants in assuming a **sense of control** and advanced **critical learning skills**

Source: [Unit 1: ref 8]

2.1. Overview of technologies and solutions available for universities and schools

Universities and schools explore the potential for digitizing education through:

- **Virtual universities**
- **Online courses**
- **Education portals**
- **Courseware**
- ...

Source: [Unit 2: ref 5]

2.1. Social Media, a new horizon for Open Source in Education

"Web 2.0 is an attitude, not a technology. It's about enabling and encouraging participation through open applications and services. By open, we mean technically open with appropriate APIs but also, more importantly, socially open, with rights granted to use the content in new and exciting contexts." (Ian Davis)

- Social media enable students to participate in a many-to-many information-sharing operation
- The traditional learning structure has undergone a radical change with the adoption of social media
- Students are getting more involved in creating blogs and other interactive web applications to enhance peer communication in and outside the classroom

Source: Davis, I. "Talis, Web 2.0, and All That" Internet Alchemy blog, July 4, 2005, http://iandavis.com/blog/2005/07/talisweb-20-and-all-that

2.2. Benefits of Open Source Software in education

1. Learning computing concepts, instead of products
2. Lowering total cost of ownership
3. Getting affordable computing at student homes
4. Customizing and reusing software
5. Extending lifetime of old hardware
6. Aiming at lucrative career opportunities

Some other relevant benefits:

- The software evolves rapidly and organically
- Open Source Software model harnesses student' collective expertise and contribution
- New versions are released very often and rely on the community

Source: [Unit 2: ref 8]

2.3. Exploration of potential impacts (also to respond to the needs emerged during COVID-19 emergency)

Some key initiatives were launched to address the pandemic in the world of education:

- **OER4Covid initiative**

The Commonwealth of Learning (COL) and the OERu join forces with the UNESCO IITE and ICDE to support online learning using open educational resources (OER). https://oer4covid.oeru.org/

- **CORONAOVIRUS | ICDE**

Tips for online teaching, webinars, and news and resources provided by the International Council for Open and Distance Education (ICDE) https://www.icde.org/corona

- **COVID-19 Open Education Community Contributed Resources**

Open Educational Resources for Teaching and Learning in the COVID-19 Era contributed by the OE community
https://docs.google.com/spreadsheets/d/1iQtZoDphA5XYKHR32zUYJ9imjCh4c1DOfg14MRB7G_I/edit#gid=0

- **Creative Commons' Response to COVID-19 | Creative Commons**

Its call to action, and promoting Open Access to education, culture and research and providing resources for online access to knowledge. https://creativecommons.org/creative-commons-response-to-covid-19/

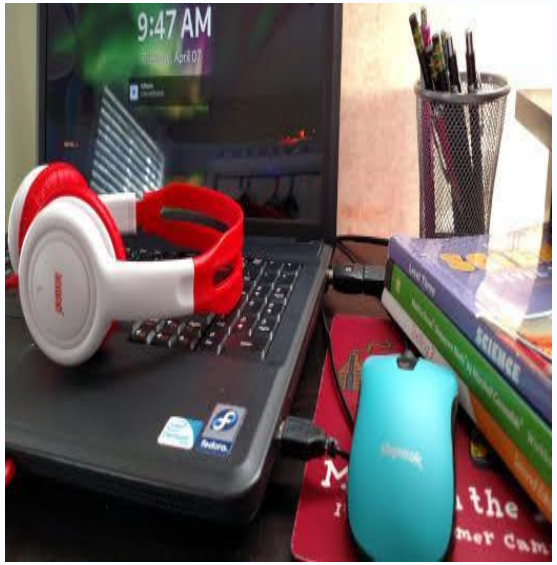
3.1 Open Source solutions Examples in Education

1. **Open source tools for students:** repurposing an older computer using Linux

2. **Learn a new language:** Scratch is an open source platform for kids learning to code

1. **Open source tools for families:** Jupyter Notebook to teach people Python by making an interactive game; Hummingbird robotics kit

1. **Open source tools for teachers:** Hugo, Wordpress, Moodle, Wikipedia



Source: [Unit 3: ref 1]

3.2. Additional Tools adopted and available for Universities

Open Badge

- An Open Badge is a digital snapshot of student's skills.
- The Badge contains extra information – metadata – which can be read by all the applications which can read Open Badges.
- Many platforms assign Open Badges and allow one to collect and show them. Bestr is one of these.

Source: [Unit 3: ref 4]

Example

Open Badge Bicocca

The University of Milano-Bicocca assign Open Badges through Bestr to its graduates, first in Italy. The experience begins on July 20, 2017 with the graduation session of the English-language master's degree course in International Economics, active from the 2015-2016 academic year. Another 68 badges follow for all other degree courses, in addition to the Open Badge International student which is issued to those who complete one or more study periods abroad as part of international mobility programs.
An innovation that University of Milano-Bicocca was the first to adopt in Italy, and of which today the numbers testify to its success. In fact, the quota of 1000 for the Open Badges issued to Bicocca students has been exceeded upon graduation, three-year or master's degree.

Source: [Unit 3: ref 10]

Did you know...

Federica.eu

An **eLearning platform** of the University Federico II of Naples which operates in partnership with the **most prestigious** public **Italian Universities** to deliver university education in **MOOC** modality (Massive Open Online Courses). Up to date, **Federica.eu** serves **200.000 users** globally

Thanks to **300** MOOCs which include **2000** lessons provided with different digital tools (6000 videos, **50.0000** slides) is the **leading platform** in Europe for **open access multimedia education**, and in the **world's top ten for the production of MOOCs**

The **University** Milano-**Bicocca** joins the partnership with its leading experience in **Data science** to offer **courses** on: Machine learning, Python, R and

https://www.federica.eu/en/partners/bicocca/

3.3. Recommendations and Conclusions (1/2)

- In our opinion the vast array of experiences, **ideas and solutions** is an advantage for the Italian Educational Institutions
- A critical issue is the **lack** of open source knowledge in schools, both in terms of **skills** and IT available staff
- Another critical point is the **integration** of various open source and proprietary systems

3.3. Recommendations and Conclusions (2/2)

- In light of previous mentioned issues we suggest to increase solutions and distribution channels **for education**
- In fact, schools need an information portfolio of **suitable,** well documented software solutions
- It's paramount fostering the growth of a network of open source related **competences** at schools and universities

Reflection

Does your University implement any Open Source technology? (e.g. Moodle)

If Yes: please share with us the experience from you university for example, discuss:

- About the feedback from teachers, students, ITC team;
- On to what extent its implementation supports in fostering the inter-relation between students and teachers

If Not: please discuss with us why their implementation is still lagging behind compared to digital transition process foster in higher education

Reflection

Does your University implement any Open Education Resource technology?

If Yes: please share with us the experience from you university for example describe:

- If your university implement a platform dedicated to MOOC, or open badge
- How your university is supporting teachers and students in learning how to use tool of OER?
- To what extent its implementation supports in fostering the inter-relation between students and teachers

If Not: please discuss with us why the their implementation is still lagging behind compared to digital transition process foster in higher education

Reflection

What's next ?

Given the premise that Open source and Educational resources are here to stay …

- ❑ Which are the main critical factors to overcome in the next future?
- ❑ How does your university enhance students' digital skills linked to various professions and tailored to the labor market needs?
- ❑ Which contribution do you think **social media** can provide as Open Source in Education to both educators and learners?
- ❑ What do you think could be the scenario in the looming of the so called "new normal"

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