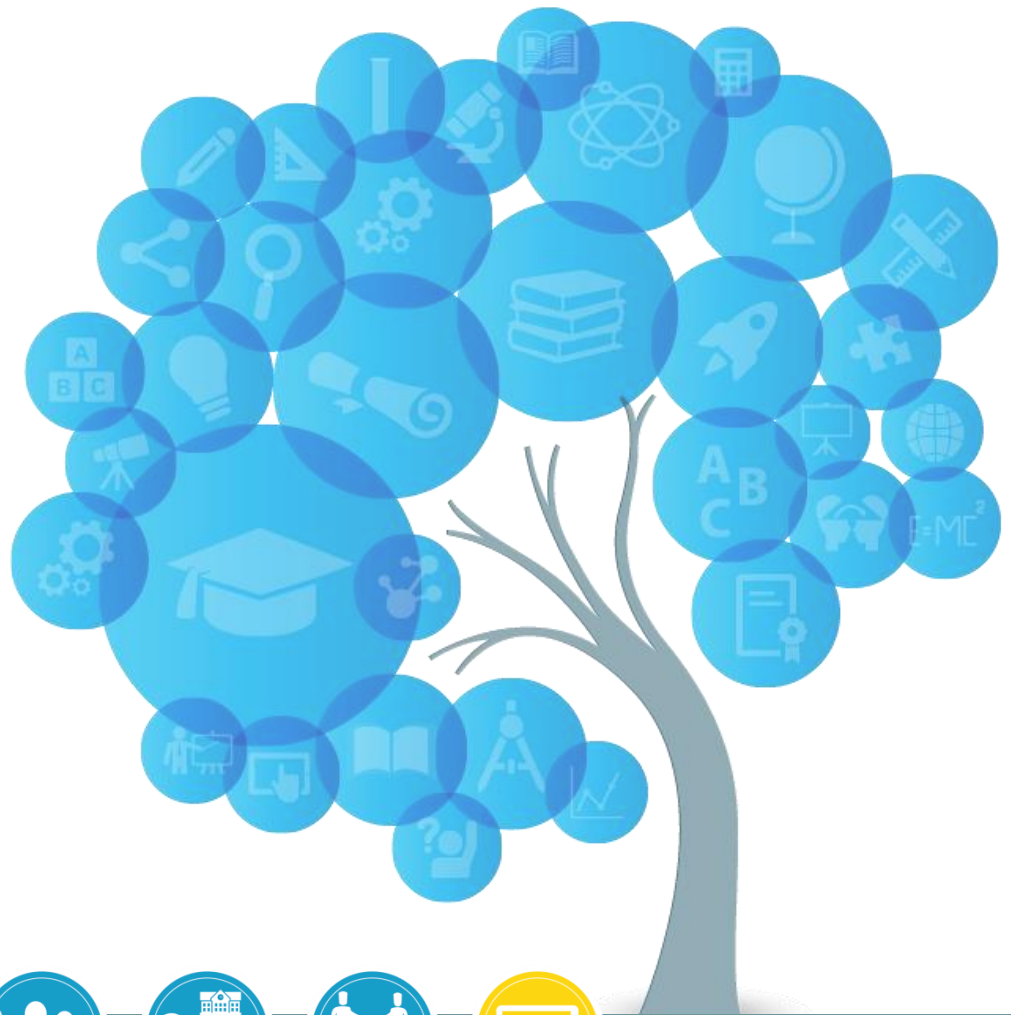




European  
Commission



# Learning analytics

Key messages

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Education  
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The third plenary meeting of the ET2020 Working Group on Digital Skills and Competences (October 2016) focused on the topic of learning analytics in education.

Speakers from research, higher education and the schools sector introduced the topic from a theoretical and practical perspective. A forthcoming study by the European Commission's Joint Research Centre on learning analytics was also discussed by the group.

## Background

### What is learning analytics and who could benefit from its use?

There is no single definition of the term 'learning analytics', however it can be loosely defined as:

*"the measurement, collection, analysis and reporting of data about learners and their contexts for the purposes of understanding and optimising learning and the environments in which it occurs".<sup>i</sup>*

A simpler definition states that *"learning analytics is about collecting traces that learners leave behind and using those traces to improve learning".<sup>ii</sup>*

Potential beneficiaries of learning analytics include:

- **Learners** who can reflect on their achievement, trends and progress in relation to their own goals or other learners; analytics can allow for a more personalised learning experience, both in formal education and beyond. Learning analytics can also play a role in improving student retention by highlighting where extra support is required at an early stage;
- **Teaching staff** who can use data to support their work with individuals and groups;
- **Groups such as course or faculty teams** seeking to improve courses or develop new curricula;
- **Institutional leadership and administration** looking to improve efficiency and effectiveness of their organisation.

Data collection in education is highly contextual and can take place on many levels, from course and individual level to institution/school level to cross-institution, region, country or even global level.

### Emerging topic in education

In the past 5-6 years, there has been a growing discussion about the potential of data to improve learning outcomes. This is due to a number of factors:

- Increased amount of data available in education (due to data collected in Learning Management Systems, online education, social media and the increased use of digital technology more generally in education). Students “digital footprint” is growing.
- Increased interest in measuring and improving performance and efficiency in education.
- The current interest in learning analytics also reflects the growing use of data in other sectors including retail and manufacturing.

A number of countries in Europe (e.g. Denmark, Norway, UK and Netherlands) are developing national approaches and are putting in place new infrastructure or competence centres to support learning analytics.

However, evidence from the use of learning analytics is patchy with many examples coming from countries outside of Europe, including the US and Australia. Challenges preventing the wider uptake of learning analytics include:

- Lack of clear vision on the purpose of learning analytics in education, and guidance and frameworks on the use of learning analytics;
- Lack of leadership for the implementation and monitoring of learning analytics;
- Lack of student involvement, particularly when it comes to data protection;
- Insufficient skills and training in using learning analytics or analysing resulting data.

## **Key messages**

### **Potential of learning analytics**

Learning analytics has the potential to contribute to the quality of teaching and learning and the modernisation of educational systems in Europe. It could play a role in supporting the policy goals of ET2020 and the recently adopted Skills Agenda.

However, the use of learning analytics to improve and innovate learning and teaching in Europe is still in its early days. High expectations about the role of data are yet to be realised.

Learning analytics needs to be tied more closely with educational theories and concepts to understand the ‘why’, the value or potential value behind data collection. Work on learning analytics should be aligned with the strategic objectives and priority areas for education and training, and supported by a clear roadmap. Pedagogies that make good use of analytics are required as well as the technology to deploy analytics. Learning analytics should be a tool to be used flexibly and as needed to support effective teaching and learning, rather than burden teachers or restrict pedagogies through technical hurdles.

## **Role of policy makers**

There is no question that the amount and variety of data collected in education will continue to grow and policy makers need to respond to the issues and opportunities that arise. Clear guidance and frameworks on data collection, storage, use and deletion and guidelines or rules on learning analytics will be needed for the educational sector. These need to cover ethical and privacy issues, data protection as well as standards and quality. Policy makers could also shape the future of how learning analytics should look and how they should be used in order to reach common goals in European education policy.

Defining or creating a regional or national point of contact on educational data and learning analytics could be useful. In a number of countries, organisational structures have been created to support research and practice in learning analytics (e.g. in 2016 Norway established a new institute on learning analytics).

## **Data protection, privacy and transparency.**

Data protection, ownership and control of data are amongst the most challenging areas of learning analytics, in particular if commercial companies are involved in the process. The implications of the new EU data protection rules of April 2016<sup>iii</sup> for use of learning analytics in the classroom are not yet fully clear and merit further study.

Data storage and access need to be looked at more closely and the approaches of different countries could provide best practices (e.g. the Netherlands has established a separate data storage warehouse for education data).

Data collection in education should be open and transparent. The public and in particular the individuals who are the subject of data collection should receive information on what personal data is collected and the way the data is treated, e.g. which algorithms are applied and how the data is interpreted. A further question is the extent to which data can be made available to researchers, private sector companies or other outside actors (open data). The DELICATE checklist developed by the European LACE project contains eight action points that should be considered by managers and decision makers planning the implementation of Learning Analytics / Educational Data Mining solutions either for their own institution or with an external provider.<sup>iv</sup>

## **More support for training and capacity building**

Depending on the concrete use of learning analytics and data in the educational context, teachers and other educational staff will need training to understand procedures, software, how to interpret data and in particular to apply learning analytics effectively for their pedagogies and vice versa.

Educational organisations and their leadership and staff need support in implementing a learning analytics strategy.

### **Practical tools and expertise are needed**

Member States need practical tools and expertise to ensure a successful and correct use of learning analytics. Sharing good practices among Member States remain important, while for example, model contracts for educational authorities could be useful to cover the data protection and privacy aspects of Learning Management Systems and/or educational apps which collect data. Finding a mechanism to understand and compare data collection principles of service providers could also be useful.

### **Standards, infrastructure, capability and interoperability**

Analysing data from different systems stored in different formats can be a challenge. Interoperability standards would help systems work together and ensure that data is portable, i.e. that vendor lock-in can be avoided.

Quality assurance processes for learning analytics is also important to help ensure rigorous data standards.

Open source learning analytics solutions should be favoured and educational authorities and establishments should encourage and support interoperability. Solutions that collect and store data in incompatible ways or closed standards that cannot be used by other software, or where vendors are reluctant to guarantee privacy and portability of data should be treated with caution.

### **Development of learning analytics needs involvement of all stakeholders**

When developing a strategy on the design, implementation and use of learning analytics, it is important to engage and involve different stakeholders - learners, educators, and relevant commercial and non-commercial organisations.

Guidance and expertise from more neutral third parties (e.g. researchers and European and/or international organisations) could help to support national and regional efforts.

### **Further need for research and cooperation**

As learning analytics is a relatively new area for most national/regional authorities and education stakeholders, there is a need to gather and examine

evidence on the potential and actual benefits of learning analytics and develop guidelines and reference documents. It is useful to share experience within and between countries and to identify areas for further research and development.

Further research is needed on the potential benefits and risks of learning analytics and current implementation should frequently be re-assessed to identify risks and missed opportunities.

Funding for forward-looking research and in particular implementation projects regarding data use in education and learning analytics should also be made available.

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<sup>i</sup>1st International Conference on Learning Analytics and Knowledge,

<sup>ii</sup><https://erikduval.wordpress.com/2012/01/30/learning-analytics-and-educational-data-mining/>

<sup>iii</sup> [http://ec.europa.eu/justice/data-protection/reform/index\\_en.htm](http://ec.europa.eu/justice/data-protection/reform/index_en.htm)

<sup>iv</sup> <http://www.laceproject.eu/ethics-privacy/>