\subsection{Learning analytics (OULA)}

%\begin{itemize}

%\item Why to use analytics data for measuring learning?

%\item References about learning analytics in CCS projects, also MOOC courses

%\end{itemize}

User analytics data are extensively used by people working in the field of business intelligence to support data-driven decision making where data are in fact the result of tracking the users behavior. The educational online environements have also their own motivations to track learner behavior, tehse motivations might be pedagogical, administrative or economical \cite{ferguson2012learning}.

A consensus around learning analytics arose in 2011 at the first International Conference on Learning Analytics and Knowledge \cite{LAK11}: “Learning analytics deals with the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs”.

Increasingly, more citizen science projects announce clearly that they have educational objectives in addition to the classical goal of adavancing science and research with the help of the crowd. Hence it is natural for an online citizen science project to track participants in order to assess the quality of their participation and the extend of their learning. The Citizen CyberLab team formed of project coordinators, developers and educationalists propose a classification of the analytics that are of interest to assess the learning and the engagement of participants \cite{LAFW}. According to this work, we can distinguish different types of analytics: demographic, engagement, learning, creativity and collaboration. As mentioned before Google Analytics allow for gathering the demographic analytics in addition to analytics related to the behavior of the participants but from an ecommerce lense, where the sole target is to track user actions on the website that lead to transactions. As we are interested in understanding how the participants learn, we need to track their behavior with a different lense and this is where the CCLtracker library reveals its usefulness.

To assess the learning of a given participant, we need data about meaningful tasks he starts, completes or interrupts, the time he spents on every task. The engagement of the participants is also an important aspect that is frequently explored in citizen science research \cite{EngProf}\cite{VolunteerEng}. As learning is correlated to engagement, we mainly need to track how long a participant stays connected to the website, how often he gets back to it, and during which period of time. Also, it is important to know quantitatively how much the participant contributes to the project. O'brien and Toms \cite{EngConcep} proposed in 2008 a convenient conceptual farmework to charcterize user engagement with technology-based applications. An extension of this framework is proposed in \cite{LAFW} and the CCLtracker library generates the needed analytics that allows to compute both the learning and engagement indicators.

% LA

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OPTsubtitle = {about},

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Schneider, Daniel and

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title={What is user engagement? A conceptual framework for defining user engagement with technology},

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journal={Journal of the American Society for Information Science and Technology},

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