Learn2Analyse: an Industry and Academia Knowledge Alliance on Educational Data Analytics

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Introduction

As teachers, **how much** do we know about our ***students***?

- do they *understand*?
- are they *bored*?
- are they *distracted*?

we know ***quite a lot***

when

we interact with them *daily*

in the *classroom* or in the

lab.

And yet:

we would like to be able to

discover more and

personalise our teaching

for **each** one of our students

But then what happens when **Teaching and Learning** moves

- From the **Physical Classroom** to the **Online Virtual Space** (the Web)
- From the **Small Groups** of Students to the **Massive Audiences** of a MOOC

How much do we know about our **Online Students** in a **Massive Online Open Course**?

Educational Organisations and

Teachers

are challenged to

Personalise Teaching and Learning:

- *Learning Experiences*
- *Guidance & Feedback*
- *Recognition of Achievements*

for **each** Individual Student.

This is already **hard to achieve**

in Physical Classrooms

with a limited number of Students,

in an **effective way**

(“*differentiate instruction*”)

It seems

impossible

to do

Online and **At Large Scale**

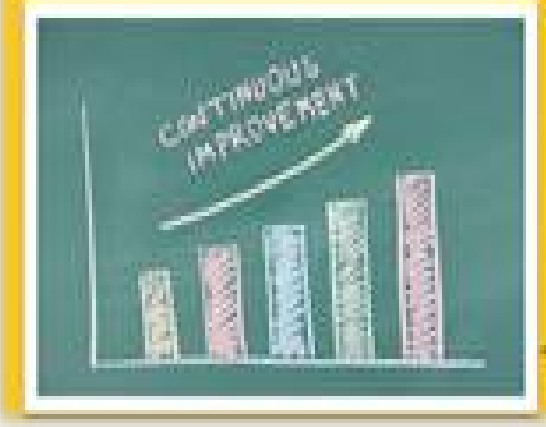
Or Is It Not?

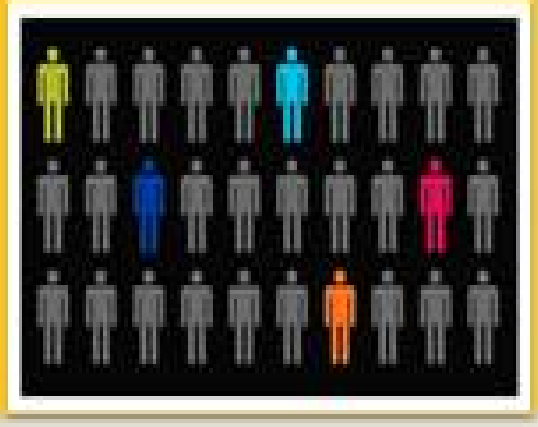
Can

Digital Technologies

help?


EDUCATION
DATA


CONTINUOUS
IMPROVEMENT



Data-driven Decision Making

the systematic collection, analysis, examination, and interpretation of data

to report, evaluate and improve the *processes* and *outcomes* at various level of education, teaching & learning, assessment to inform practice and policy in educational settings

- The aim of data-driven decision making is to report, evaluate and improve the processes and outcomes at various level of education, teaching & learning, assessment

Educational Data

Collected and organised to represent all aspects of teaching and learning, including

Profiling and **Interaction** Data

Students, Teachers, Learning Environment

derived from

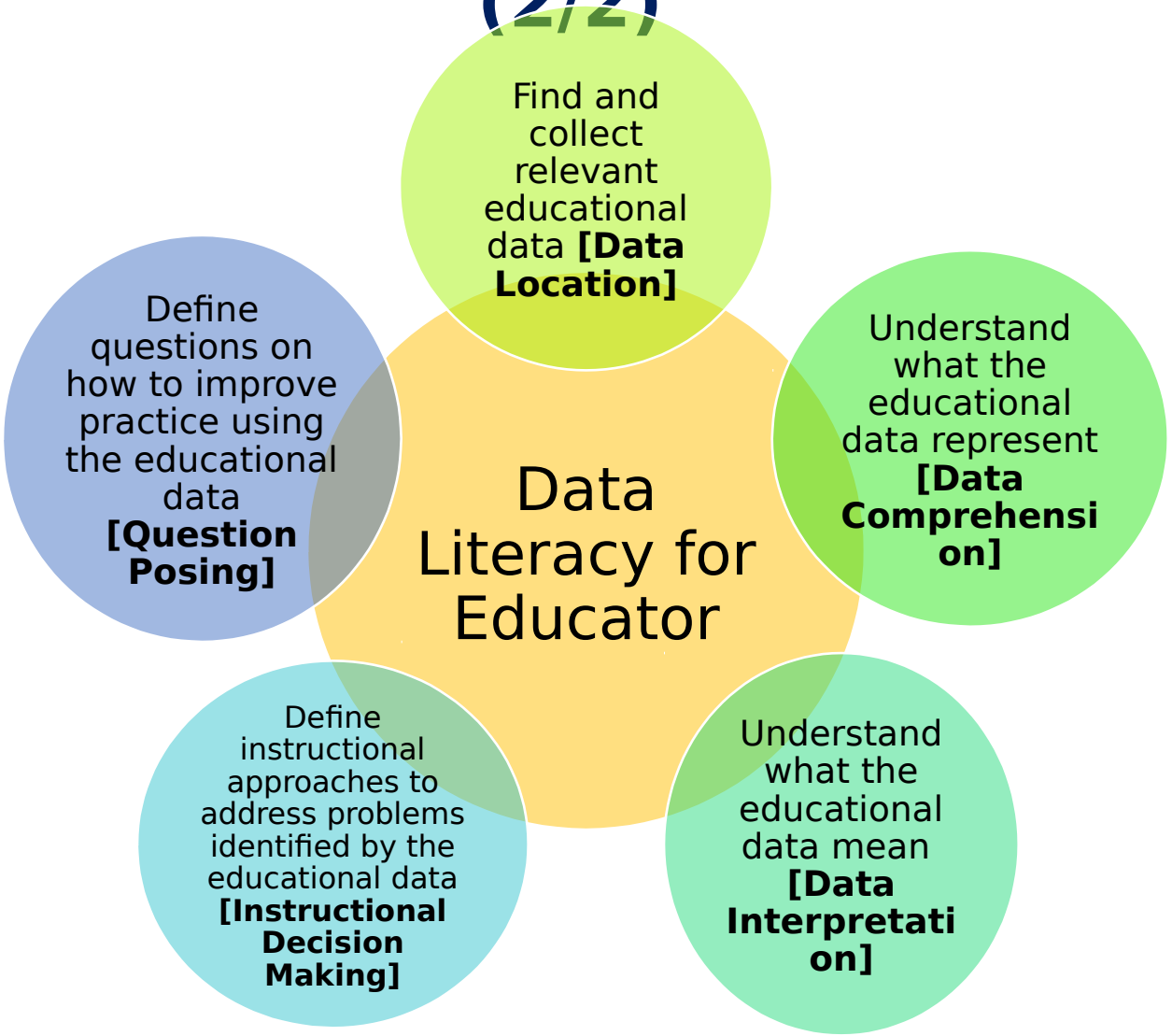
qualitative and quantitative methods

Data Literacy for Educators (1/2)

- the ability to understand and use data effectively to inform decisions

- a competence set to locate, collect, analyze/understand, interpret, and act upon Educational Data from different sources so as to support improvement of the teaching, learning and assessment process

Data Literacy for Educators (2/2)



Reflective Practice

"[A process that] involves thinking about and critically analyzing one's actions with the goal of improving one's professional practice"

Types of Reflective practice

Reflection-In-Action

Takes place while the practice is executed and the practitioner reacts **on-the-fly**

Reflection-On-Action

Takes a more **systematic** approach in which practitioners intentionally **review, analyse** and **evaluate** their practice after it has been performed, documenting the process and results

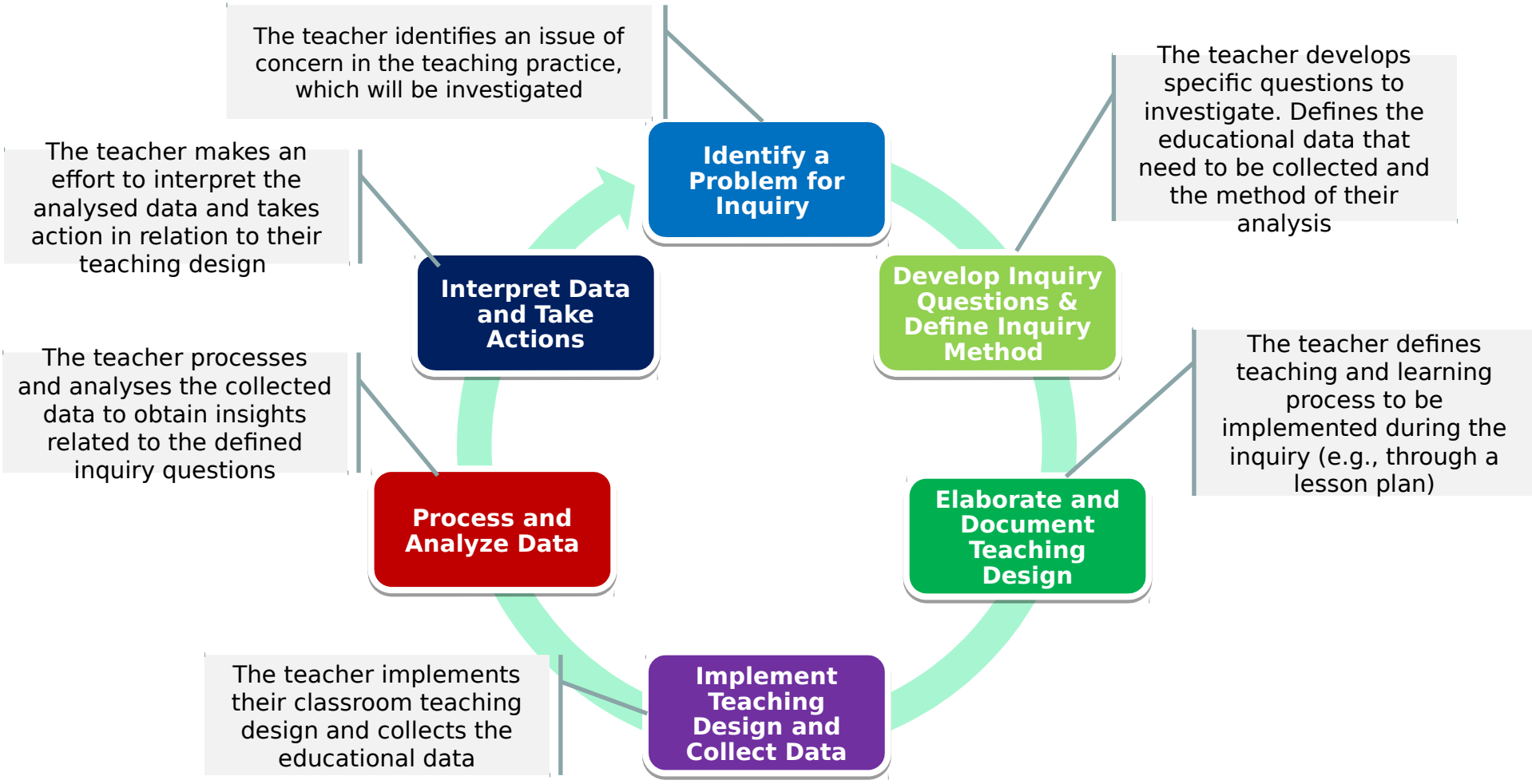
Teaching and Learning Analytics mainly support Reflection

Teacher Inquiry (1/2)

- “[a process] that is conducted by teachers, individually or collaboratively, with the primary aim of understanding teaching and learning in context”

- The main goal of teacher inquiry is to improve the learning conditions for students

Teacher Inquiry (2/2)



Educational Data Analytics Technologies

Teaching Analytics	methods and digital tools to visualize, analyze, and/or assess **teaching practice**
Learning Analytics	methods and digital tools to collect, analyze and report student-related educational data towards monitoring the **learning process**
Teaching & Learning Analytics	to support the process of **reflective practice**: facilitating teachers to reflect on their teaching design using evidence from the actual delivery to their students

Teaching Analytics: Analyse Teaching Design

for self-reflection and improvement

- *Visualize the **elements** of a lesson plan*
- *Visualize the alignment of a lesson plan to **educational objectives / standards***

through sharing with peers or mentors to receive feedback

- *Support the process of **sharing** a lesson plan with **peers or mentors.** allowing them to provide **feedback** through comments*

through co-designing and co-reflecting with peers

- *Allow **peers** to **jointly analyze and annotate** a common teaching design in order to allow for co-reflection*

Learning Analytics

- Collection of learner data during the delivery of a teaching design (e.g., a lesson plan) to ***build/update individual student profiles***.

- **Types of learner data** typically are "*Dynamic Student Data*":
  - **Engagement in learning activities.** For example, the progress each learner is making in completing certain learning activities.
  - **Performance in assessment activities.** For example, formative or summative assessment scores.
  - **Interaction with Digital Educational Resources and Tools,** for example which educational resources each learner is viewing/using.
  - **Emotional data**, for example stress, boredom, anxiety.

Educational Data Analytics

Descriptive Analytics	***"what has already happened":*** they are related to existing *data summarization*, namely the visualization of ***past data***
Predictive Analytics	***"what will happen":*** they are related to processing existing data for *pattern elicitation*, so as to make estimations of ***future trends***
Prescriptive Analytics	***"what should we do":*** they are related to generating decision-support ***recommendations for actions***

Teaching and Learning Analytics

Teacher Inquiry Cycle Steps	How TLA can contribute
Identify a Problem to Inquiry	**Teaching Analytics** can be used to capture and analyse the teaching design and help the teacher to: • pinpoint the specific elements of their teaching design that relate to the problem they have identified; • elaborate on their inquiry question by defining explicitly the teaching design elements they will monitor and investigate in their inquiry.
Develop Inquiry Questions and Define Inquiry Method	
Elaborate and Document Teaching Design	
Implement Teaching Design and Collect Data	**Learning Analytics** can be used to • collect the learner data that the teacher has defined to answer their question. • analyse and report on the collected data in order to facilitate interpretation.
Process and Analyse Data	
Interpret Data and Take Actions	The combined use of **Teaching and Learning Analytics** can be used to map the analysed data to the initial teaching design, answer the inquiry question and generate insights for teaching design revisions.

Learn2Analyze:
An Academia-Industry Knowledge Alliance for enhancing Online Training Professionals' (Instructional Designers and e-Trainers) Competences in Educational Data Analytics

European Commission

ERASMUS+ Key Action 2

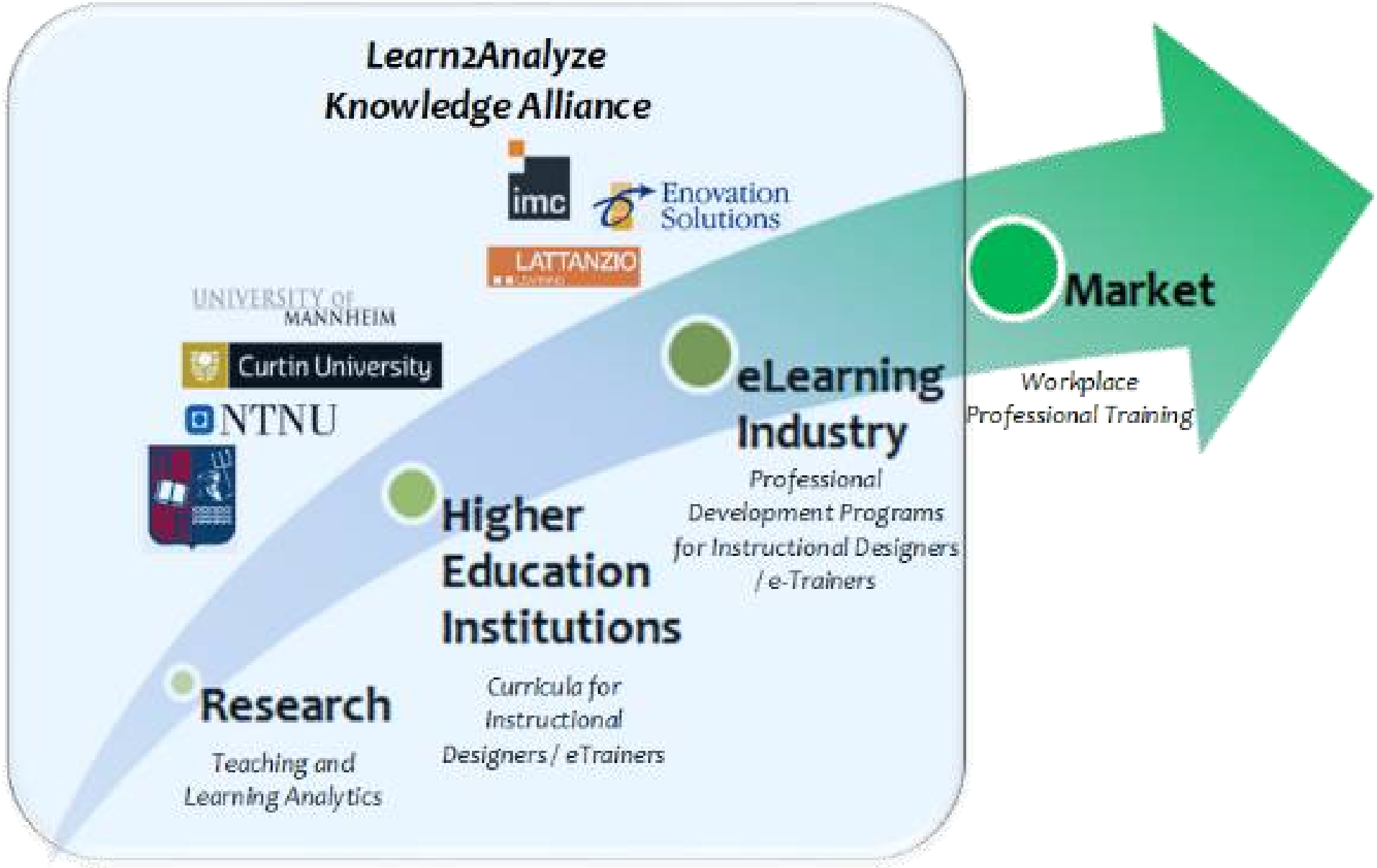
"***Cooperation for innovation and the exchange of good practices - Knowledge Alliances***"

Academia – Industry

End User Communities

A Knowledge Alliance to **Learn2Analyze**

- Improve existing competence frameworks for **instructional designers** and **e-trainers** of online courses with new **Data Literacy** competences for using emerging **Educational Data Analytics** methods and tools.
- Develop and evaluate a professional development **Massive Open Online Course** for cultivating these competences with emphasis to authentic experiences to individual learners, integrated into real work-oriented tasks


Learn2Analyze
Knowledge Alliance
imc
Enovation Solutions
LATTANZIO
UNIVERSITY OF MANNHEIM
Curtin University
NTNU
Market
Workplace
Professional Training
eLearning Industry
Professional Development Programs for Instructional Designers / e-Trainers
Higher Education Institutions
Curricula for Instructional Designers / eTrainers
Research
Teaching and Learning Analytics

EDU1x: Analytics for the Classroom Teacher

edX MOOC, Curtin University

EDU1x Analytics for the Classroom Teacher

8000 enrollments from 145 countries since October 2016