



Buying innovative learning technology for higher education

Lessons from the LEA project



TABLE OF CONTENTS

1 Introduction

- 1.1 What is the LEA Project?
- 1.2 Relevance for universities

2 Resources on Learntech

- 2.1 What is Learntech?
- 2.2 Reports on Learntech

3 Resources for Procurers

- 3.1 Unpacking Innovation Procurement
- 3.2 Reports & Guidelines for PCP/PPI

4 Ready to get started?

- 4.1 LEA Resource Centre
- 4.2 Get involved!

1 Introduction

This report is aimed at procurers of higher education institutions with the purpose of highlighting relevant resources produced in the LEA project that may be of interest to support their innovation procurement of learning technology.

1.1 What is the LEA Project?

The LEA Project's goal is to accelerate knowledge transfer, dialogue and awareness raising of innovation procurement within the learning technology sector. Innovation procurement puts users in the drivers' seat of technology development, and brings competitive advantage to EU companies by raising their innovation to a market leader level. The project was funded under the European Union's Horizon 2020 research and innovation programme, and runs between March 2018 and June 2020.

1.2 Relevance for Universities

In 2020, education is facing a challenge like never before. To slow the spread of COVID-19, schools and universities in 188 countries have been closed, impacting almost 90% of the world's student population. As classes move online, the use of effective digital communication platforms and learning technology has become essential for students to be able to continue learning. Higher education institutions can learn from this crisis - and be more resilient in the future - by putting the power of innovation procurement to work.

Universities are hubs of research and knowledge-creation, and as such are often at the cutting edge of development of new technologies and methods. This is especially the case for learning technology, which universities may both create or contribute to through research and use with students. At the same time, as public institutions, universities can represent a significant early-adopter market to raise the profile of learning technology that is accessible and tailored to students' needs.

Institutions of higher education should strive to offer a holistic learning experience that reflects the complexity and diversity of their student body, while preparing students for careers in the modern workforce. To this end, learning technology such as personalised learning environments (PLEs) can contribute to improved efficiency of course delivery and assessment by professors as well as technological literacy and career readiness of students. Special attention should be paid to the digital divide

between students who or do not have access and skills to use digital technologies, which may be exacerbated by economic crisis. Learning technology should serve as a bridge rather than a wall between educational institutions and students – offering enriched tutorship opportunities and greater flexibility and accessibility, which can ultimately help prevent drop outs.

In fact, universities across Europe are already using learning technologies to enhance and expand the learning experience they offer. European universities' strategies often cite innovative technology and digital systems as part of developing high-quality and accessible learning environments, while also improving teaching efficiency. (Flavin & Quintero, 2018)

"Learning technologies are used in new ways, to advance beyond what was possible in the classroom or to combine traditional approaches with e-learning in effective and worthwhile modes to meet new objectives and purposes of teaching and learning."
– **Gilli Salmon (2005)**

2 Learntech

2.1 What is Learntech?

Learntech – or learning technology – can be defined as the broad range of communication, information and related technologies that can be used to support and facilitate learning, teaching and assessment (Association for Learning Technology, 2018). Learning technologies can be software or hardware. Trends in the learning technology field have changed over last two decades: first, from learning object repositories to Massive Open Online Courses (Gasevik et al., 2014); then, the focus shifted to learning management systems and finally to personalised learning environments.

- **PERSONALISED LEARNING ENVIROMENT (PLE)**

PLEs are systems enabling students to control and define their own learning processes under the mentoring of a teacher. They include adapted learning methods based on a student's unique ability, skills and goals. The PLE system allows connecting students, professors and the wider education community by means of open and commercial ICT solutions inside and outside the campus facilities, supporting a lifelong learning process.

2.2 Reports on Learntech

The LEA project published various reports on the state of the art of learning technology, the innovation gap for PLEs, and analysis of functional needs and future scenarios of learning technology for both educators and students. Herein a brief review of the available publications and highlights of interest for higher education procurers.

[Needs analysis for Personalised Learning Environments \(PLE\) in STEM](#)
[\(LINK\)](#)

This report analyses functional requirements and trends in technology-enhanced learning through 2018. Though the research focuses on STEM-content for primary and secondary schools, there are also relevant take-aways for higher education. One conclusion is that cloud-based services and cloud computing techniques have emerged with tools to fit almost any educational task, including tools for professors to track students' grades and progress, create standard-aligned curricula and

generate analytics. The possibility of students easily accessing resources about any topic, combined with the presence of a PLE as scaffolding guiding their activity towards a learning goal, allows for activities of higher cognitive load to be addressed in in-person sessions with professors. The key requirements for a PLE to be a successful aid to learning include:

- **Ease of use** – the user interface design and content creation features should be intuitive and easy to use for both students and professors. Tools should reduce planning time for professors, while also adapting personalised learning for students.
- **Personalised user profile and dashboard** – Each student's unique user interface reflects their learning style, personal goals, learning resources and calendar. Learning analytics allow for increased personalisation and opportunities for understanding and optimising student performance.
- **Interoperability** – The platform should be accessible from any device (e.g. tablet, smartphone, laptop, desktop) at anytime and from anywhere. Content creation should allow for resources to be shared from other sources. Cloud storage and cloud computing should allow for access to, exchange and retention of resources.
- **Support student-centred learning** – Content is adapted for personalised needs and goals. Gamification could offer more dynamic and engaging learning processes and bolsters students' ownership of their progress. A virtual tutor may mediate a comprehensive set of resources to adaptively support a student.

This publication also contains a methodology for procurers of learning technology to conduct their own needs assessment workshop, which can guide them through establishing minimum requirements that fit their values, the course content and students' needs. Scenarios of PLE use are explored and resulting priorities are discussed in various cultural contexts (Spain, Portugal, Italy, Sweden and Finland).

[The state-of-the-art in learning technology: Analysis of 8 companies' innovative PLEs \(LINK\)](#)

This report evaluates the innovative features offered by eight leading PLEs from: It's Learning, Blackboard, Microsoft Delve, Claned, Priima, Oridi, Peda.net and Mobie

Academy. LEA's state-of-the-art analysis shows that innovation gaps still remain in both PLEs and learning technologies in general. Figure 1 summarises the results of the comparison of innovative features of PLEs on the market in 2018.



Figure 1: LEA D4.1 - PLE State of the Art Report, 2018

Overall, communication between professors and students is well-supported through chat functions. On the other hand, content creation tools should be bolstered from basic resources to more emerging forms, such as virtual or augmented reality, map-based or avatar-based content. Further, learning analytics in PLEs currently on the market tend to only reflect information on results, rather than diagnosing why certain outcomes occur, predicting learning behaviour, or actively prescribing resources and actions to improve learning outcomes. More complex learning analytics could allow for virtual mentorship to adaptively support students with specific resources according to their needs. Though the state-of-the-art has not yet proven successful integration of artificial intelligence (AI) into PLEs, the LEA Project's evaluation points to AI as the greatest (and most probable) realm of future developments in learntech. Procurers should bear in mind, however, that European universities employing learntech will have to comply with GDPR regulations on collection and use of personal data. Procurers and educators should be wary of what data is collected and how it may be used in order to ensure students are protected.

Looking towards the future, LEA expects the following innovative advancements in learntech for higher education:

1. Advances in **virtual reality** toward augmented and mixed reality.
2. Increase in robots and teaching **programming & computational thinking** throughout the curricula.
3. Advances in **artificial intelligence** will enable adaptive learning content and automatic personalised learning support.

3 Resources for procurers

3.1 Unpacking Innovation Procurement

- **PUBLIC PROCUREMENT OF INNOVATION (PPI)**

PPI occurs when the public sector uses its purchasing power to act as an early adopter of innovative solutions that are not yet available on a large-scale commercial basis but are nearly or already in small quantity in the market and don't need new Research & Development (R&D).

- **PRE-COMMERCIAL PROCUREMENT (PCP)**

PCP is a public procurement of R&D services. It is an important tool to stimulate innovation as it enables the public sector to steer the development of new solutions directly towards its needs when there are no near-to-the-market solutions yet available. PCP can then compare the pros and cons of alternative competing solutions approaches. This will in turn enable to de-risk the most promising innovations step-by-step via solution design, prototyping, development and first product testing. By developing a forward-looking innovation procurement strategy that uses PCP and PPI in a complementary way, public procurers can drive innovation from the demand side. This enables the public sector to modernize public services faster while creating opportunities for companies in Europe to gain leadership in new markets.

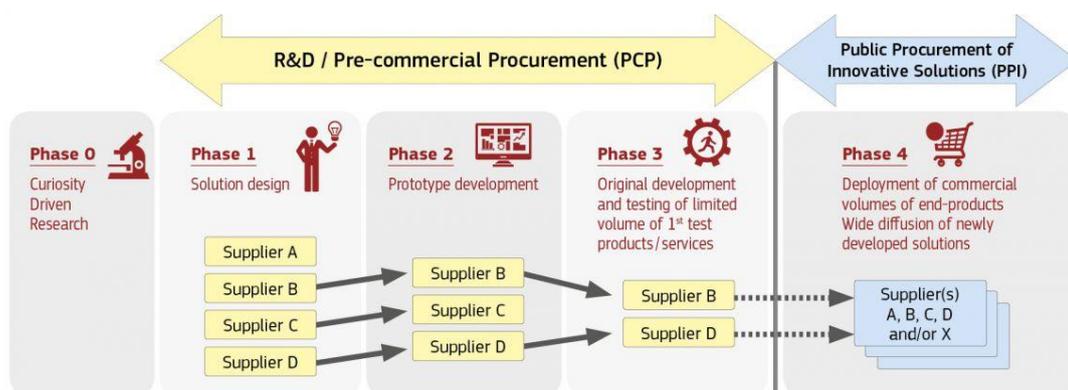


Figure 2: PCP & PPI - European Commission DG Connect, Digital Single Market Website

3.2 Resources for Procurement of Innovation

3.2.1 General European PPI Guidance

[The European Commission's Guidance on Innovation Procurement](#) ([LINK](#))

The European Commission recommends innovation procurement as an approach that can deliver high quality and modernised public services on an optimal budget, address arising needs, help start-ups and SMEs launch and grow, and move markets towards innovation – all while achieving various policy goals. This comprehensive guidance covers all of the phases of innovation procurement in steps to enable procurers to:

- identify their needs and set the level of ambition;
- build market capacity and attract innovators;
- design the market consultation, technical requirements, award criteria and contract performance to suit innovative solutions (including guidance on specific innovation-friendly procurement procedures such as competitive dialogues, design contests, innovation partnerships and pre-commercial procurement); and
- get inspired by best practice examples of innovation procurement in action across Europe.

[The European Commission's 'Digital Single Market' website](#) ([LINK](#))

Despite the cross-cutting strategic importance of PCP and PPI, compared to other parts of the world, these innovative procurement procedures are currently underutilized in Europe. To bolster the market leadership of European innovation, the European Commission hosts a 'Digital Single Market' website with centralised support and guidance on PCP and PPI, as well as a compilation of the European Commission's targeted actions on the topic. Content covered includes:

- **Policy framework:** EU policy initiatives in support of PCP and PPI and best practice examples of national and regional initiatives on PCP and PPI across Europe

- **EU co-financing:** Horizon 2020 and Structural Funds (ESIF) opportunities for financing to support public procurers facing common challenges of PCP and PPI, as well as impacts achieved by completed projects
- **Networking – Experience sharing – Training:** Information on events, local assistance, the DG Connect newsletter, and Procurement Forum and LinkedIn groups on PPI to network with other procurers and stakeholders

Procurement of Innovation Platform's Guidance ([LINK](#))

The Innovation Procurement Platform (innovation-procurement.org) – featuring news and events, best practice case studies, resources and guidance – is a one-stop-shop for those interested in PCP and PPI. The platform's guidance document contains practical advice and examples of PPI, as well as step-by-step how-to advice on a variety of procurement procedures. The Innovation Procurement Platform's Resource Centre also contains many resources to help you get started with innovation procurement, including criteria sets and case studies.

3.2.2 Resources for PPI of Learntech from the LEA Project

Digital tools for increasing stakeholder dialogue in PPI processes ([LINK](#))

Experience shows that a successful PPI depends on smooth dialogue between supply and demand – it should begin early in the process, and there should be means to ensure that the different parties are involved in the discourse on the same level. (Clements & Wallin, 2017) This publication introduces the Innovation Procurement Dialogue (IPD) Model for facilitating communication between educational institutions, end users of the technology (professors and students), learntech experts, and suppliers of innovative solutions. Further, it introduces 13 digital tools (including networks, forums and assistance centres) at the national or European scale that can serve as channels to support dialogue in PPI processes.

Open Market Consultation Methodology ([LINK](#))

This publication guides procurers of learntech through the objective and methodologies of open market consultation (OMC). As an essential step in the PPI process, an OMC is used to understand the gap between the demand (needs of universities) and the supply (learntech on the market). This is mutually beneficial, as procurers can find out what the current state-of-the-art is in regards to a specific call,

while it also increases market actors' awareness of public procurers' particular needs and procurement plans. The LEA Project developed the 4A approach to OMCs:

1. **Alert** – inform the market about an upcoming PCP/PPI, for example, with a prior information notice (PIN)
2. **Attract** – attract innovators by creating a supplier information package (SIP), which explains the project's advantages for suppliers
3. **Ask** – conduct a request for information (RIF) to ask suppliers what you need to know in workshops or webinars
4. **Announce** – announce the call for tenders on an accessible platform, for example, TED

[PPI Invitation to Tenders / Request for Tenders template \(LINK\)](#)

This template is a practical and ready-to-use tool for procurers to complete and launch their request for tenders for an innovative solution, in accordance with the EU public procurement directives. The suggested structure is accompanied by detailed guidance on what to consider, such as the relevant legal frameworks and means to ensure each party's obligations are met.

4 Ready to get started?

4.1 LEA Resource Centre

See all of the resources highlighted in this report and more in the LEA Project Resource Centre for procurers: www.learntechaccelerator.eu/procurers

4.2 Get involved!

Participate in the interest group on innovation procurement for universities on the Procurement Forum, where you can connect, exchange and learn from other university procurers across Europe also interested in innovation procurement:

procurement-forum.eu/group/1866621/innovation-procurement-for-universities

Join the LEA-Network to connect with other procurers with similar needs. By signing up, you will receive access to an online training course in innovation procurement plus access to the LEA Procurement Challenge Tool – a practical resource developed to help procurers of education match their needs and interests with other procurers across Europe. Find out more:

www.learntechaccelerator.eu/lea_n

Get in touch with us! Should you have inquiries relating to the LEA Project or the contents of this report, please contact:

coordinator@learntechaccelerator.eu / procurement@iclei.org

References

- **Association for learning technology (2018)** Definition. Available online at: <https://www.alt.ac.uk/about-alt/what-learning-technology>, accessed 26.7.2018
- **Clements, K. & Wallin, E. (2017)**. Innovations to design personalized learning environments for STEM education of the future? In EDULEARN17 Proceedings. 9th International Conference on Education and New Learning Technologies Barcelona, Spain. International Association of Technology, Education and Development IATED.
- **Flavin, M., & Quintero, V. (2018)**. UK higher education institutions' technology-enhanced learning strategies from the perspective of disruptive innovation. *Research in Learning Technology*, 26.
- **Gasevic, D., Kovanovic, V., Joksimovic, S., & Siemens, G. (2014)**. Where is research on massive open online courses headed? A data analysis of the MOOC Research Initiative. *The International Review of Research in Open and Distributed Learning*, 15(5).
- **Salmon, G. (2005)**. Flying not flapping: a strategic framework for e-learning and pedagogical innovation in higher education institutions. *ALT-J*, 13(3), 201-218.