Policy recommendations for learning analytics from three stakeholder workshops

LACE

Learning Analytics Community Exchange

Policy recommendations for learning analytics from three stakeholder workshops

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This document presents policy recommendations related to the use of learning analytics and educational from three LACE workshops

Contents

Introduction 1
The Policies for Educational Data Mining and Learning Analytics Briefing 2
Presentations 2
Interviews 4
Workshops 4
Policy recommendations and conclusions for schools 6
Policy recommendations and conclusions for higher education 8
Data standards 8
Support for practitioners 8
Support for institutions 9
Policy recommendations and conclusions for workplace learning 10
Concluding comments 12
Participants list for the LACE workshops at the Policies for Educational Data Mining and Learning Analytics Briefing, 15 April 2015 13
About 15

Introduction

The management of data, its analysis, and the formulation of appropriate policy responses have become crucial issues for both public and private organisations, and educational institutions and administrations are no exception to this. In the case of education, and indeed public services generally, this development has gone hand-in-hand with an enthusiasm for evidence based decision making, and initiatives to identify and promote 'what works' in order to improve the effectiveness of education systems. Selwyn (2014) provides a valuable summary of work carried out to chart this transformation in education.

However, the particular characteristics of the educational environment create challenges in the deployment and management of these techniques. Education is a huge economic sector, but, despite its ubiquity, the purpose, products and benefits of education are contested to a degree that places it apart from other industries and services. As a result, the nature and processes of education are also the focus of intense political debate, as are the criteria for a successful education system. Similarly, education has also proved strongly resistant to globalisation, or even European integration, with national cultures and administrations maintaining major differences in structure, policy and practice across education systems. In view of this it becomes a complex undertaking to address questions such as:

- How can data analytics enhance education and learning?
- What policies should be adopted with regard to data analytics by educational institutions and administrations, and other organisations concerned with learning,?
- Are there legitimate concerns about the impact of data analytics on education and learning, and, if so, what are they?

The challenging nature of these questions has had, at least, two important consequences. Firstly, in recognition of the particular characteristics of education, the fields of educational data mining and learning analytics have been established as distinct areas of research, distinguished from other applications of data analysis that make use of the same techniques. Within these fields a large amount of practice has been generated in a wide range of institutions and contexts, together with an extensive associated academic discourse. Secondly, the results of work in these fields have been proposed as not only a way of improving the effectiveness of the education system, but also as a means of resolving conflict between the multiplicity of views of the nature of the education system itself. As Williamson (2015, p.12) states

> *Educational data visualization does not simply provide a mimetic representation built upon the accumulation of data from individual pupil performances, but makes education actionable through the production and stabilization of specific kinds of views of what education and learning should be.*

Policy makers are therefore confronted by two questions, neither of which has a simple answer:

1. What are the features of education, to which analytics can be usefully applied?
2. To what extent can analytics determine what the features of education are?

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Thus analytics can be seen the servant of educational managers and policy makers, providing information about the activities which are underway in institutions. It can also be used to make higher-level claims about the nature of the system which is being analysed. Unless one is willing to cede authority to learning analytics as being the source of undisputed truth about education, this recursive relationship generates still greater complexity for the policy maker to deal with.

The purpose of the Learning Analytics Community Exchange (LACE) project is not to carry out research to provide answers to these complex issues, but rather, as its name suggests, to facilitate exchange of information and perspectives which can enable decision makers at various levels and contexts to get to grips with the appropriate ways of applying analytics within the educational domains in which they operate.

Given the absence (or perhaps impossibility) of universal guidelines on the application of learning analytics, it is valuable for educational policy makers, managers and teachers to have the opportunity to compare and contrast their practice, and to reflect on how this may or may not be applicable to their own responsibilities. In this document we review the issues which were priorities for a group of European educational administrators, professionals and academics in considering analytics and its relationship to policy and practice. We hope to contribute to the sector-wide reflection which is needed to make progress towards a fuller picture of the role of analytics in education.

References

Selwyn, N. 2014. Data entry: towards the critical study of digital data and education. *Learning, Media and Technology*. pp. 64-82. DOI: 10.1080/17439884.2014.921628

Williamson, B. 2015. Digital education governance: data visualization, predictive analytics, and 'real-time' policy instruments. *Journal of Education Policy*. DOI: 10.1080/02680939.2015.1035758

The Policies for Educational Data Mining and Learning Analytics Briefing

This document was developed from the *Policies for Educational Data Mining and Learning Analytics Briefing* that took place in Brussels the 15th April 2015. The event took place in the Thon Hotel EU, Rue de la Loi/Wetstraat 75 in Brussels, and was organised by the LACE project consortium in collaboration with the PELARS, Lea's Box and WatchMe project consortia and with the support of European SchoolNet. The *Briefing* was aimed at educational policy-makers, influencers and stakeholders as well as political representatives interested in getting to grips with the current state-of-the art in learning analytics and educational data mining. Those taking part were introduced to the latest developments in this field and the expanding number of tools which set out to measure learning impact. LACE carried out a number of interviews with participants, which are included below. Participants were invited to take part in discussions on how best to develop policies related to the fair and ethical use of such data in schools, universities and the workplace. Participants in these were briefed that their discussion would form the basis of the present review paper.

Presentations

The first session included three distinguished speakers, and the LACE project takes this opportunity to thank them for their valuable contributions to the event. The session was opened by Julie Ward, a Member of the European Parliament Committee on Culture and Education (CULT). There followed

two invited speakers: Robert Madelin Director-General, Directorate General for Communications Networks, Content and Technology, and Dragan Gašević Chair in Learning Analytics and Informatics, University of Edinburgh and President Elect of the Society for Learning Analytics Research. Dragan Gašević's presentation is available on the LACE SlideShare channel.

Speakers at the opening session, left to right: Dragan Gašević, Julie Ward, Robert Madelin with the Chair of the session, Sally Reynolds of LACE.

After discussion and a coffee break, the remainder of the morning was dedicated to an *Introduction to European Commission-supported initiatives related to the use of learning analytics and educational data mining in Schools, Universities and Workplace Training*. The following presentations were made, and the detailed agenda and speaker biographies are available on the LACE Website.

- LACE: Dr. Hendrik Drachsler, Open University of the Netherlands, The Netherlands.
- Lea's Box: Dr. Michael Kickmeier-Rust, Knowledge Technologies Institute, Graz University of Technology, Graz, Austria.
- PELARS: Dr. Manolis Mavrikis, Institute of Education, University College London, UK.
- WatchMe: Dr. Marieke van der Schaaf, Utrecht University, & Denise Janssen, Mateum, NL.

Plenary sessions

Interviews

Throughout the day the LACE team recorded interviews with a number of the experts and stakeholders present at the event. The collection of interviews is available on the LACE videos page, and direct links to the individual interviews are also provided from the images below.

Jan Buytaert
Go!, Vlaamse Gemeenschap

Patrice Chazerand
Policy Director, DIGITALEUROPE

Ruth Drysdale
Senior Project Manager, Jisc

Marco Fichera
Directorate-General for Informatics (DIGIT), European Commmission

Susan Flocken
European Trades Union Committee for Education

Mihaela Georgieva
MEP Assistant, European Parliament

Robert Madelin
Director General, DG Connect

Ernestina Menasalvas
Professor of the Universidad Politécnica de Madrid, representing the Big Data Value Association

Patricia Wastiau
Principal Advisor for R&D, European Schoolnet

Workshops

Following the inputs of the morning session, the afternoon was dedicated to three parallel 90 minute workshops, organised by the LACE project. The format chosen for the workshops was that of an open discussion with participants given the task of coming up with an agreed set of recommendations on policy related to the use of learning analytics and educational data mining in schools, higher Education and the workplace environment. Following the workshop sessions, participants gathered in plenary to report back on the discussions in the separate groups, and to put forward the research issues, topics and directions they believed to be most pertinent and ones which need to be addressed by the research community. The reports of the rapporteurs were compiled, shared for comment, and then brought together in this review document.

Afternoon workshops: the Higher Education strand

In total 47 participants took part in the workshops, 18 in higher education, 17 in schools, and 12 in workplace learning. A wide range of European countries was represented, including Austria, Belgium, Denmark, England, Estonia, Germany, Italy, Luxembourg, Netherlands, Norway, Scotland, Slovenia, Sweden and Turkey. The participants had a wide range of expertise in the three areas covered by the workshop, including representatives from the European parliament and other European institutions, university service providers, ministries of education, school support agencies, education researchers and stakeholders, trade and commerce institutions and industrial stakeholders.

The workshop leaders and rapporteurs were drawn from the LACE consortium, follows:

Schools: *Workshop leader*: Peter Karlberg from Skolverket/Swedish National Agency for Education/LACE. *Rapporteur*: Patricia Wastiau from European Schoolnet with the support of Bart Rienties from the Open University, UK.

Higher education: *Workshop leader*: Tore Hoel, Oslo and Akershus University College of Applied Sciences, Oslo, Norway. *Rapporteur*: Rebecca Ferguson, The Open University, Milton Keynes, UK.

Workplace learning: *Workshop leader*: Fabrizio Cardinali, CEO of Skillaware (the new company for workplace learning and performance support analytics solutions of the sedApta Group) and leader of WP5 LACE project. *Rapporteurs*: Marieke van der Schaaf, (Utrecht University, The Netherlands) and Maren Scheffel (Open University, The Netherlands) were rapporteurs of the session.

Policy recommendations and conclusions for schools

Outcomes of the Schools workshop at the LACE Policies for Educational Data Mining and Learning Analytics Briefing, 15 April 2015

The group spent some time discussing the context of this session and agreed that it was better described as the output of a stakeholders group interested in the application of learning analytics in the school context to policy-makers rather than as a set of outputs and recommendations made by policy-makers.

They also agreed that the use of learning analytics was still somewhat rare in schools, with few reports and experiences available in the public domain. The group proposed that it was worth considering learning analytics in this context under two distinct headings: the use of learning analytics at system (school/region/network/ministry) level and the use of learning analytics at individual level. It was also pointed out that by their very nature, schools are different from universities and the workplace in that students are generally required by law to attend school. There is usually no opportunity to opt-out of the education system, which means that school students' data is automatically part of the overall school system.

The participants also agreed that in general few references were available as to how learning analytics were being used in a pedagogical context to improve students' learning as led by teachers. They agreed that the current emphasis in the school context was far more on the potential risks associated with the use of learning analytics, rather than on the opportunities.

The following list provides a summary of the main discussion points that emerged and points towards a set of conclusions that were agreed amongst participants in relation to the use of learning analytics in schools. It includes direct policy recommendations, which are of potential value at institution, regional, sector or national level as well as recommendations that relate less to policy and more to practice.

Importance of democratic control: When introducing policies related to the use of learning analytics, policy-makers should be mindful of the importance of well-informed consent. This includes making sure those giving consent are aware as to what data will be used and for what purpose and the period of usage of such data. The eventual ownership of such data also needs to be addressed, taking into account the rights and responsibilities of all parties involved, including students, teachers and parents. All use of such data should be as transparent as possible and respect the privacy of everyone involved. Students should know what is happening with their data and how it is being used.

Data use considerations: the discussion group felt strongly that the use of such data should only ever be indicative and used for suggestions and/or recommendations in relation to the student's learning. It should definitely NOT be the only source for decision-makers when it concerns students' learning opportunities and circumstances. Such data should also preferably only ever be used at the micro-level

Need for capacity-building: there is a clear need for capacity building amongst everyone involved when it comes to the effective use of learning analytics in schools. This includes building capacity

amongst parents, teachers, schools and policy-makers in how to critically use learning analytics tools and the resulting data, this includes helping teachers move beyond the use of tools to a more interpretative level so they are aware as to what is going on behind the algorithms. It is also important to be sure everyone is aware as to what it is not possible to gather data on and to take this also into account in their planning.

Focus on ethical questions: the group agreed that schools' data must not be sold for purely commercial purposes and schools should ensure they have a secure framework in place to protect schools' data. However they did also agree that it was important the data emerging from schools does also need to be made available to researchers and others concerned with improving learning opportunities in schools.

In wrapping up the discussion, it was agreed that a thoughtful human-based responsible attitude should be used to drive the process of introducing comprehensive learning analytic-based systems in schools.

Policy recommendations and conclusions for higher education

Outcomes of the Higher Education workshop at the LACE Policies for Educational Data Mining and Learning Analytics Briefing, 15 April 2015

The following list provides a summary of the main discussion points that emerged, and points towards a set of conclusions that were agreed amongst participants in relation to the use of learning analytics in higher education. It includes direct policy recommendations which are of potential value at institutional, regional, sector or national level as well as recommendations that relate less to policy and more to practice. We have grouped them under several broad headings to facilitate further discussion.

Data standards

Identify requirements for data collection: Requirements for data collection, and structures for doing this on a sector or national basis should be identified.

Introduce standards for privacy, ethics and data protection: Privacy and ethical issues are important. Institutions should be encouraged to develop policies covering privacy, ethics and data protection. However, this is a broader issue than educational policy making and legislation. We should aim to influence the wider debate.

Introduce and encourage the use of data standards: It is important to support the development of data standards and to encourage their use, so that there is a standardisation of data to support interoperability.

Ensure data is associated with metadata using standard conventions: Policy-makers need to take into account that it is not just the data that analysts are concerned about, because once data is removed from its context it does not necessarily make sense. Data need to be associated with metadata that are produced using standardised conventions.

Share standard datasets, with which others can be compared: Educational authorities and stakeholders should support the development of standard datasets at national and/or international level, against which other data can be compared, to see if performance is above or below the norm.

Guard against data degradation: Those responsible for data management should guard against data degradation and be sure to develop and make available methods of retaining data over time.

Support for practitioners

Identify and share good practice: Identify behaviours related to the use of learning analytics and educational data mining in the field of education that regional or national governments should support and encourage. Share best practice at different levels.

Enable networking and community support: It is important to support the work of relevant initiatives like LACE in their role of community support and networking, which includes communicating both good and bad examples. Such examples are important when considering the

development of policies in this area as they provide valuable evidence that can be used to inform policy.

Enable the sharing of expertise across countries and disciplines: Support learning analytics researchers and practitioners to work with researchers and practitioners in other fields (such as medical research and institutional research) who will have encountered and dealt with related issues.

Support for institutions

Produce model agreements for institutions to use and adapt: There is a need to produce a model agreement for institutions to act as trusted data partners as well as other templates that can be used by institutions when implementing their learning analytics policies.

Support institutions to evaluate the tools and resources on offer: Support and advice should be made available to institutions to address the problem of over-claiming and mis-selling by vendors – institutions do not necessarily have access to the expertise that allow them to interpret and assess these claims and so trusted independent advisors are of significant importance.

Introduce procedures for due diligence when deploying interventions: There is a need to identify – and make both explicit and transparent – procedures for due diligence around intervention strategies. This includes addressing the competencies staff need, and certification opportunities relating to such competencies.

Enable institutions to retain control of their data: Educational authorities and stakeholders need to identify strategies and put into practice mechanisms that prevent the providers of educational tools selling institution's own data back to it.

Policy recommendations and conclusions for workplace learning

Outcomes of the Workplace Learning workshop at the LACE Policies for Educational Data Mining and Learning Analytics Briefing, 15 April 2015

This section provides a summary of the main discussion points that emerged in the Workplace Learning workshop, and points towards a set of conclusions that were agreed amongst participants in relation to the use of learning analytics in the workplace. It includes direct policy recommendations, which are of potential value to policy developers, whether at institution, regional, sector or national level.

The workshop was developed using the Rapid Outcome Mapping Approach (ROMA)[1] as a discussion template. This model, presented in the morning session by Dragan Gašević, is made up of a six-part cyclical process, as shown below:

1. Map political **context**.
2. Identify key **stakeholders**.
3. Identify desired **behaviour changes**.
4. Develop engagement **strategy**.
5. Analyse **internal capacity** to effect change.
6. Establish monitoring and learning **frameworks**.

This process was used to identify the appropriate main focuses of EU and national Learning Analytics policies today and in the near future. Each point was discussed by the group, and interesting ideas were generated from the brainstorming:

Map political context: as a key driver for employability and entrepreneurship, EU and national, LA policies should enforce decision taking, problem solving and process digitisation skills, capabilities and competences.

Identify key stakeholders: as key stakeholders for transformation, EU and national LA policies should engage, support and 'onboard' (i.e. make them participate) industrial actors (industrial leaders, employers and also workers), institutions (governments, education authorities, education and trade unions, etc.), social partners and teachers.

Identify desired behaviour changes: as a key behavioural change, EU and national LA policies should fast forward uptake of 21st century working skills such as collaboration/networking, problem solving, leadership, entrepreneurship, analytical and data analysis, privacy and security skills.

Develop engagement strategy: as a key engagement strategy, EU and national LA policies should foster awareness/behaviours and investments amongst all stakeholders in order to make them understand that new working methods and conditions in cyber physical ecosystems will progress human workforce to higher skills and competencies.

[1] See http://www.roma.odi.org/introduction.html

Analyse internal capacity to effect change: as a key driver to manage change towards the industrial landscape, EU and national LA policies should encompass all contexts of lifelong learning from K12 to further education, HE, vocational & individual informal learning.

Establish monitoring and learning frameworks: as a key monitoring and learning framework for change, EU and national LA policies should foster open and interoperable data-driven ecosystems for accelerating the data/model/transform life-cycle in order to improve workflows.

The results of this discussion will be used as a starting point for the preparation of a white paper, or a manifesto, on suggestions and recommendations for the development of future EU policies on Learning Analytics and Educational Data Mining, which will be an important instrument workplace learning in the LACE project and among its members and associates.

Concluding comments

In reviewing the results of the workshops, reported above, it is salutary to note how distinct the recommendations of the three groups were, with regard to developing policies related to the fair and ethical use of such data in schools, universities and the workplace.

The Schools group stressed the importance of democratic control, and argued that the results of analytics should not be the only source for decision-makers when it concerns students' learning opportunities and circumstances. They also emphasised the limitations on analytics, recommending that it should be used at the micro-level, that people should be aware of areas where it is not possible to gather appropriate data, and that data must not be sold for purely commercial purposes. It seems that the schools group perceived the opportunities available through analytics, but no mention was made of enabling schools to implement their own analytics systems. The proposed policy priorities revolved around a concern to maintain the central role of professional judgement of educationalists.

The Higher Education group shared some of the concerns expressed by the Schools group, but, unlike the schools group, it had a strong focus on the technical standards required to support analytics work, and the sharing of professional expertise among practitioners and managers in deploying and interpreting analytics. It seems that policy priorities of the Higher Education group revolved around a concern to provide the infrastructure and expertise to enable teachers and institutions to implement appropriate analytics systems.

The Workplace Learning group, in contrast to both other groups, was focused on high-level policies, which the EU could establish to promote the adoption of analytics for learning in the workplace. The initial work carried out in the workshop points towards a set of conclusions that were agreed amongst participants in relation to the use of learning analytics in the workplace. These will be followed up to develop a manifesto, to be published on the LACE website, which will be addressed to policy makers at institutional, regional, sectorial or national level.

The groups were composed of well-informed representatives of each sector, but so varied is each sector that small groups such as these cannot hope to be representative of the European landscape as a whole. Moreover the approach taken by the individual workshop leader in each group may well have influenced the focus of each group. Nevertheless, the wide range of policy approaches taken by each group indicates that even within an individual education system, a policy which is based on a single approach to analytics across the three sectors is unlikely to be successful. The proposals contained in this review will offer a starting point for reflection on how the policy priorities vary for the three sectors which we have considered.

Participants list for the LACE workshops at the Policies for Educational Data Mining and Learning Analytics Briefing, 15 April 2015

Name	Organisation	Country
Higher Education		
Tore Hoel	Oslo and Akershus University College of Applied Sciences, Oslo	Norway
Rebecca Ferguson	The Open University, Milton Keynes	UK
Richard Valkering	University of Amsterdam	Netherlands
Daniel Spikol	Malmö University, Sweden	Sweden
Ruth Drysdale	JISC	UK
Nils Siemens	Amsterdam University of Applied Sciences / Hogeschool van Amsterdam (HvA)	The Netherlands
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Enrico Turrin	Federation of European Publishers	Italy
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Alan Berg	University of Amsterdam	The Netherlands
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Shuting Gao	Department of Computer and System Sciences (DSV), Stockholm University	Sweden
Kairit Tammets	Tallinn University	Estonia
Schools		
Peter Karlberg	Skolverket/Swedish National Agency for Education/LACE	Sweden
Patricia Wastiau	European Schoolnet	Belgium
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Karen Triquet	VUB & EduLab	Belgium
Francesca Borrelli	European Commission DG Connect	Luxembourg
Daniele Di Mitri	Maastricht University and EUCIS-LLL	Netherlands
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Lorna Stokes	ENOLL/PELARS	Belgium
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Manolis Mavrikis	Institute of Education/PELARS	UK
Hendrik Drachsler	Open University Netherlands	Netherlands
Workplace		
Fabrizio Cardinali	Skillaware – sedApta Group, LACE Project	Italy, Moderator
Marieke van der Schaaf	University of Utrecht, WatchMe Project	The Netherlands, Rapporteur
Maren Scheffel	Open University of the Netherlands, LACE Project	The Netherlands, Rapporteur
Marco Paini	sedApta Group, LACE Project	Italy
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Jasmine Glaser	EU Representation of the Federal Austrian Economic Chamber	Belgium
Mihaela Georgieva	EU Parliament, assistant	Belgium
Denise Janssen	Mateum	The Netherlands
Gabor Kismihok	University of Amsterdam	The Netherlands
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Fiorella Belciu	DG CNECT, EC, Trainee	Belgium
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About ...

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Rebecca Ferguson is a lecturer at The Open University in the UK, focused on educational futures, learning analytics, MOOCs, augmented learning and online social learning. She is a member of the steering committee of the Society for Learning Analytics Research (SoLAR).	
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Marco Paini is working as a member of the national and EU R&D Projects team of the sedApta Group. Marco has also worked in R&D Projects for world leading manufacturing IT solution provider Siemens and for other national and international companies.	

Sally Reynolds is a Director of ATiT which she co-founded in 1999 where she leads on dissemination work for several EU projects including MEDEAnet, SAILS, EMMA and Inspiring Science Education. Sally is an experienced editor, event manager and European dissemination strategist and in LACE is supporting the events strategy.	
Bart Rienties is Reader in Learning Analytics at the Institute of Educational Technology at the Open University UK. He is programme director Learning Analytics within IET and Chair of Student Experience Project Intervention and Evaluation group, which focusses on evidence-based research on intervention of 15 modules to enhance student experience.	
Marieke van der Schaaf is an Associate Professor and coordinator of the master program Educational Design and Consultancy at Utrecht University. Her research focuses on quality improvement of formative and summative assessments. In particular she studies how assessment can stimulate students' and professionals' learning. She is coordinator of the WatchMe project.	
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About LACE

The LACE project brings together existing key European players in the field of learning analytics & educational data mining who are committed to build communities of practice and share emerging best practice in order to make progress towards four objectives.

> *Objective 1 – Promote knowledge creation and exchange*
> *Objective 2 – Increase the evidence base*
> *Objective 3 – Contribute to the definition of future directions*
> *Objective 4 – Build consensus on interoperability and data sharing*

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