

I. Key Trends Accelerating European Ed Tech Adoption

Fast Trends: Driving changes in schools over the next one to two years

- The abundance of resources and relationships made easily accessible via the Internet is challenging us to revisit our roles as educators.
- The amount of data is increasing, making content curation a critical 21st century skill.
- Increasingly, students want to use their own technology for learning.
- Social media is changing the way people interact, present ideas and information, and communicate.

Mid-Range Trends: Driving changes in schools within three to five years

- As the cost of technology drops and schools/municipalities revise and open up their access policies, it is becoming more common for students to bring their own mobile devices.
- Education paradigms are shifting to include online learning, hybrid learning, and collaborative models.
- Openness — concepts like open content, open data, and open resources, along with notions of transparency and easy access to data and information — is becoming a value.
- The technologies we use are increasingly cloud-based, and our notions of IT support are decentralized.

Long-Range Trends: Driving changes in schools in five or more years

- More and more, learning takes place in different kinds of formal and informal networks.
- The nature of digital learning, from the design of the learning environment to how it is experienced by the teacher and individual student is changing radically.
- The technological possibilities of using digital peer feedback online are increasing at a rapid pace.
- There is an increasing interest in using new sources of data for personalizing the learning experience and for performance measurement.

II. Significant Challenges Impeding European Ed Tech Adoption

Urgent Challenges: Those which we both understand and know how to solve

- Some of the most urgent challenges in Europe are local, involving shortcomings in infrastructure or systemic lack of use of existing resources.
- The demand for personalized learning is not adequately supported by current technology or practices.
- Despite a range of national and EU wide media literacy initiatives, research shows that the levels of knowledge and skills in children and teenagers are not as adequate as previously anticipated, especially for the dimensions of critical and participatory literacy.
- Initial teacher education needs updating to encompass digital learning.

Difficult Challenges: Those we understand but for which solutions are elusive

- Learning that incorporates real life experiences is not occurring enough and is undervalued when it does take place.
- New models of education are bringing unprecedented competition to the traditional models of education.
- Schools must address the increased blending of formal and informal learning.
- We need to address the current asymmetry in the type of technologies developed for education: we have many teaching technologies (LMS, electronic whiteboards, OER, etc.) and much less authentic learning technologies.

Wicked Challenges: Those that are complex to even define, much less address

- We live in a complex world where everyone needs to be capable not only of complex, even expert thinking, but also complex communication.
- A redefinition of the value added by the education system is taking place.
- We are not using digital media for formative assessment the way we could and should.
- We need to help students be designers and architects of their learning environments, working in collaboration with classmates and teachers to co-construct learning.

III. Important Developments in Educational Technology

Time-to-Adoption Horizon: One Year or Less

- Cloud Computing
- Flipped Classroom
- Apps
- Tablet Computing

Time-to-Adoption Horizon: Two to Three Years

- Games and Gamification
- Learning Analytics
- Massive Open Online Courses
- Mobile Learning

Time-to-Adoption Horizon: Four to Five Years

- Personal Learning Environments
- Virtual Assistants
- Virtual and Remote Laboratories
- Visual Data Analysis

Research Question One Tallies — Technologies to Watch

topic	total	voters	1 yr	2-3 yrs	4-5 yrs
Tablet Computing	75	35	25	9	1
Learning Analytics	62	33	6	14	13
Mobile Apps	61	34	24	7	3
BYOD	61	32	19	11	2
Collaborative Environments	55	34	17	7	10
Cloud Computing	55	34	23	6	5
Flipped Classroom	55	29	22	5	2
Mobile Learning	53	30	10	15	5
Open Content	53	28	11	10	7
Games and Gamification	47	27	8	15	4
Personal Learning Environments	45	25	4	6	15
Massive Open Online Courses	44	25	7	13	5
Electronic Publishing	42	21	10	5	6
Class Management and Classroom Technologies	39	24	10	12	2
Social Networks	38	24	14	7	3
Online Learning	36	24	9	8	7
Virtual and Remote Laboratories	35	24	4	6	14
ePortfolio	34	24	14	8	2
Badges / Microcredits	30	18	6	5	7
3D Printing	28	20	2	10	8
Augmented Reality	28	19	2	8	9
Makerspaces	21	13	1	6	6
Virtual Assistants	20	12	--	1	11
3D Video	19	13	2	3	8
The Internet of Things	18	13	--	4	9
Crowdsourcing	18	13	1	5	7
Visual Data Analysis	17	13	--	2	11
Mobile Broadband	15	11	2	5	4
Digital Identity	14	12	2	2	8
Collective Intelligence	14	10	--	5	5
Telepresence	13	11	--	3	8
Single Sign-On	12	11	3	4	4
Information Visualization	12	10	3	3	4
Semantic Applications	12	8	1	3	4
Quantified Self	10	8	1	1	6

Location Intelligence	9	7	1	3	3
Real-Time Machine Translation	9	7	--	1	6
Open Licensing	8	7	1	5	1
Natural User Interfaces	8	7	--	3	4
Preservation and Conservation Technologies	8	5	--	2	3
Open Hardware	7	7	--	--	7
Wireless Power	7	7	--	2	5
Speech-to-Speech Translation	7	6	--	3	3
Crowdfunding	7	5	--	2	3
Flexible Displays	7	5	1	--	4
Location-Based Services	6	6	2	1	3
Geolocation	6	5	--	3	2
Next Generation Batteries	5	5	--	--	5
Tacit Intelligence	3	3	--	1	2
Electrovibration	3	2	--	--	2
Statistical Machine Translation	3	2	--	1	1
Modeling Software	2	2	1	1	--
Near Field Communication	2	2	--	--	2
Machine Learning	2	2	--	--	2
Cellular Networks	2	2	--	1	1
Affective Computing	2	2	--	--	2
Syndication Tools	1	1	--	1	--

Research Question Three Tallies — Trends

topic	total	voters	fast	mid-range	slow
Social media is changing the way people interact, present ideas and information, and communicate.	81	39	26	8	5
Increasingly, students want to use their own technology for learning.	80	38	25	11	2
More and more, learning takes place in different kinds of formal and informal networks.	79	38	15	11	12
As the cost of technology drops and schools/municipalities revise and open up their access policies, it is becoming more common for students to bring their own mobile devices.	74	35	14	16	5
The abundance of resources and relationships made easily accessible via the Internet is challenging us to revisit our roles as educators.	72	38	24	10	4
Openness — concepts like open content, open data, and open resources, along with notions of transparency and easy access to data and information — is becoming a value.	72	37	17	14	6
The amount of data is increasing, making content curation a critical 21st century skill.	72	36	24	8	4
There is a new emphasis in the classroom on more challenge based, active learning.	72	36	17	9	10
Education paradigms are shifting to include online learning, hybrid learning, and collaborative models.	71	36	12	16	8
The nature of digital learning, from the design of the learning environment to how it is experienced by the teacher and individual student is changing radically.	62	31	4	12	15
The technological possibilities of using digital peer feedback online are increasing at a rapid pace.	58	29	7	10	12
In a world where the information is available on almost every device, ideas are the crucial point of competitiveness.	58	29	7	11	11
There is an increasing interest in using new sources of data for personalizing the learning experience and for performance measurement.	57	35	9	12	14
The technologies we use are increasingly cloud-based, and our notions of IT support are decentralized.	52	30	6	14	10
People expect to be able to work, learn, and study whenever and wherever they want.	51	30	11	12	7
The world of work is increasingly collaborative, driving changes in the way student projects are structured.	49	32	9	11	12
Mobility and social networks are colliding, giving new perspectives on the concept of an "Anywhere School."	49	25	5	12	8
Technology continues to profoundly affect the way we work, collaborate, communicate, and succeed.	46	27	10	7	10

Computers as we know them are in the process of a massive reinvention.	46	26	4	11	11
Socio-economic and political trends mitigate against innovation and technology adoption.	38	19	4	5	10

Research Question Four Tallies — Challenges

topic	total	voters	urgent	difficult	wicked
Initial teacher education needs updating to encompass digital learning.	103	41	31	8	2
Despite a range of national and EU wide media literacy initiatives, research shows that the levels of knowledge and skills in children and teenagers are not as adequate as previously anticipated, especially for the dimensions of critical and participatory literacy.	86	37	25	8	4
Too often it is education's own practices that limit broader uptake of new technologies.	81	33	14	11	8
Schools must address the increased blending of formal and informal learning.	80	39	17	15	7
Learning that incorporates real life experiences is not occurring enough and is undervalued when it does take place.	78	38	11	18	9
We are not using digital media for formative assessment the way we could and should.	75	34	6	14	14
Many activities related to learning and education take place outside the walls of the classroom and thus are not part of traditional learning metrics.	73	35	12	14	9
New models of education are bringing unprecedented competition to the traditional models of education.	72	32	6	15	11
Many of the most difficult challenges in European countries are local.	72	31	19	4	8
Education is moving to complexity and system thinking.	68	27	5	7	15
We need to address the current asymmetry in the type of technologies developed for education: we have many teaching technologies (LMS, electronic whiteboards, OER, etc.) and much less authentic learning technologies.	67	32	5	15	12
The demand for personalized learning is not adequately supported by current technology or practices.	64	35	18	12	5
We need to deal with Issues of data protection.	61	32	11	11	10
A redefinition of the value chain of education is taking place.	59	29	2	9	18
As we are integrating Internet based activities and services into education settings the need for a faster and broader Internet increases.	57	29	13	10	6
We need to make kids the architects of their collaborative learning environments.	55	30	9	9	12
Simply staying organized and current presents a challenge in a world where information, software tools, and devices proliferate at the rate they do today.	41	19	7	5	7
There is a mainstreaming gap in education.	34	19	8	4	7

There are health issues related to the high exposure to electronic devices.	20	11	1	2	8
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